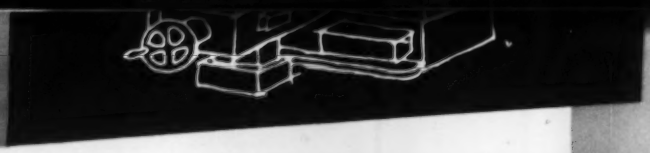

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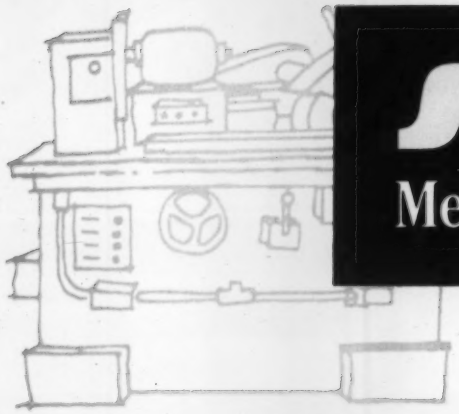
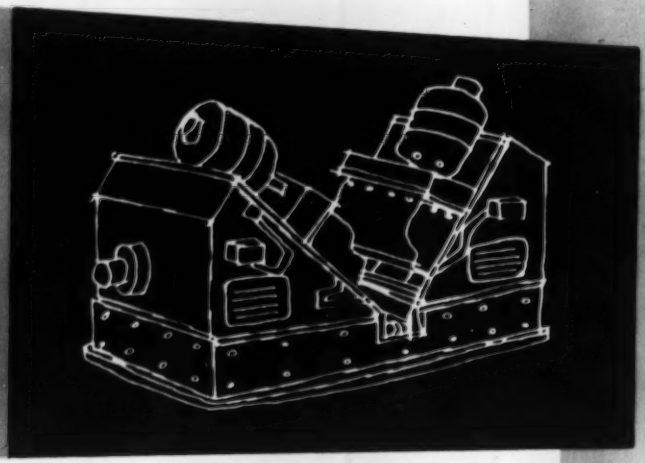


STEEL
The Metalworking Weekly

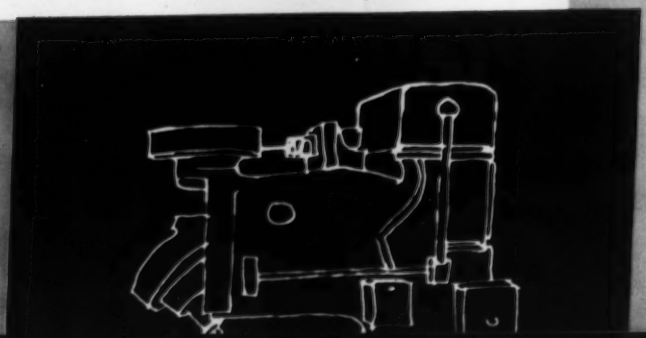


When To Re-Equip

STEEL's Simplified Guide signals the route to a profit answer . . . see page 99

A PROGRAM FOR MANAGEMENT IN 1955

No. 5 in 1955 Management Series



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THIS IS AETNA-STANDARD

SEAMLESS TUBE MILLS

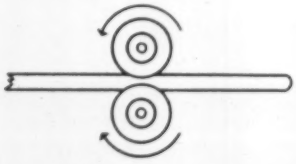
Aetna continues to conceive many new ideas for the production of seamless tubing. This continued progress, plus reputation and experience, helps Aetna-Standard to continue as world's leading designer and builder of Seamless Tube Mills.

ROLLS

Aetna specializes in manufacture of small and medium-sized iron-base rolls. Aetna is pioneering in the use of Nodular Iron for rolls and castings under trade name of Magaloy.

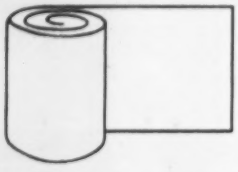
FLAT-ROLLED FINISHING EQUIPMENT

This is one of Aetna's six major product lines. Flat-rolled embraces such equipment as: Shearing and Classifying; Scrubbing and Drying; Recoiling; Slitting and Side Trimming; Roller Levellers (two-high and four-high); Reels of all kinds; and many other products.



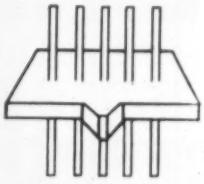
CONTINUOUS BUTT WELD PIPE MILLS

Over the years, new ideas and engineering accomplishments have strengthened Aetna's position as the only builder in America of Continuous Butt Weld Pipe Mills. In recent months, Aetna Pipe Mill equipment has been installed in America, in Canada, in Germany, in England, in Japan and in Argentina.



CONTINUOUS COATING

This year Aetna will have completed the building of 25 continuous galvanizing lines, in addition to several terne and electrolytic tinning lines. Aetna has worked closely with industry in this development and is considered the pioneer in continuous coating equipment.



COLD DRAWING

The world over, Aetna-Standard is recognized as the leading authority and builder of cold draw equipment for tubes and bars. This year marked introduction of several innovations by Aetna, such as the air gripper carriage and hook.

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Aetna Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

SUBSIDIARY and ASSOCIATED COMPANIES

Head Wrightson Machine Company, Ltd., Middlesbrough, England— Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.
Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.
M. Castellvi, Inc., New York, N. Y. — Mexico, Central and South America.
Societe de Constructions de Montbard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.
Demag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.
Compagnia Italiana Forme Acciaio, Milano, Italy — Italy.
Aetna-Japan Company, Ltd., Tokyo, Japan — Japan.
Hale & Kullgren, Inc., Akron, Ohio — Representative for the Rubber Industry.
Standard Engineering Company, Ellwood City, Pa.
Trans-World Traders, Pittsburgh, Pa.

Designers and Builders to the Ferrous, Non-Ferrous, Leather, Rubber, and Plastic Industries

(Advertisement)

Tool Steel Topics

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

This Bearcat punch (shown above man's wrist) punches 15 square holes in each ½-in. steel plate, used as cutting edge of snow plows. Average life of punch is 5500 holes, with only three light redressings.

See What They Gained by Switching to Bearcat!

One of the operations performed in the shops of Frink Sno-Plows, Inc., Clayton, N. Y., is punching 15 holes, 11/16 in. square, in a carbon-steel plate. The plate, ½-in. thick, is used as the cutting edge of highway snow plows. With grades of steel previously used in this punching operation, the service life of each punch varied considerably—anywhere from 300 to 1500 holes.

We felt confident that Bearcat tool steel could do better, and they agreed to give it a trial.

So Bearcat was put to work, with the punch hardened to Rockwell C56-57. Production went up immediately. Now the life of each punch is approximately 5500 holes, with only light redressing of the corners required every 1500 holes or so.

Bearcat is a tough, general-purpose air-hardening tool steel. When used in punches, its chief advantages are exceptional resistance to shock, and superior resistance to wear. Besides, Bearcat's air-hardening characteristic minimizes quenching hazards, and provides good resistance to distortion in heat-treatment.

In addition to punches, there are many other applications where Bearcat can be used to advantage: rivet sets, for example, and chisels, gripper dies, hot headers, master hobs and die-casting die inserts, to name only a few.

Why not learn for yourself how good a tool steel Bearcat really is! You can order it right now through your Bethlehem tool steel distributor. It can also be obtained from our well-stocked mill depot.

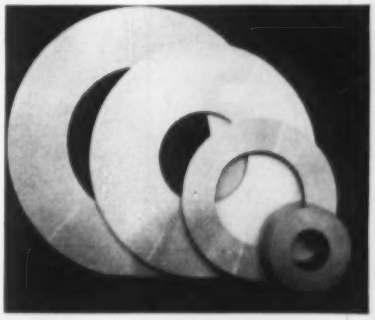
BETHLEHEM TOOL STEEL ENGINEER SAYS:

Switching Grades Won't Cure Tool Troubles

Granted that quality is of primary importance in tool steel. But there are four other factors which are also essential to the satisfactory performance of tools: (1) good design, (2) correct heat-treatment, (3) proper grinding, and (4) proper application and mechanical use of the tool.

Ordinarily a manufacturer's responsibility lies only in quality. Yet if results are unsatisfactory the user often concludes that "the steel is no good," whereas any of the other factors mentioned may be the real culprit. That is why it is so important to investigate all five of these factors. For they are like links in a chain; unless they are in reasonably good balance, trouble can be expected. When this happens, the tool and its work must be investigated thoroughly before a remedy can be suggested.

In the majority of cases, switching grades is not the answer in attempts to cure trouble with tools, for the difficulty usually lies elsewhere. Before switching grades, the user should first have a clear-cut reason for doing so, and definite objective. Otherwise, the original trouble may be intensified, rather than removed.



BETHLEHEM HOLLOW-BAR SAVES TIME IN RING-TYPE APPLICATIONS

If you work with ring dies, draw rings, or hardened bushings, you can save time by using Bethlehem Hollow-Bar Tool Steel, either in BTR (oil-hardening) or Lehigh H (high-carbon, high-chrome). Hollow-Bar is made by high-speed trepanning. By this process, hammer-forged or hot-rolled bars are cored out, and are then rough-turned on the outside. With Hollow-Bar, there's no need to wait for forged rings or discs.

the finest precision parts are finished on Heald machines

FIVE DIFFERENT JET ENGINE PARTS ON ONE HEALD BORE-MATIC

The Model 322 Bore-Matic shown above borizes critical surfaces on five entirely different jet engine components — each with a different fixture and tooling setup. Easily interchangeable fixtures and boring tools enable this one machine to perform a variety of semi-finishing and finishing operations on the different parts — with minimum down-time for changeovers.

From supersonic jets to commercial airliners — *precision* is vital to sustained flight, accurate navigation, safe landings and take-offs. That's why so many aircraft parts today are precision finished on Heald Bore-Matics, Internals and Rotary Surface Grinding Machines.

Jet engines, reciprocating engines, propeller parts, landing gear, aircraft instruments, sighting devices and guided missiles—all require the extreme accuracy and precision that have become almost a tradition with Heald machines.

Whether the job calls for long runs or frequent changeovers, you'll get maximum precision plus maximum production on a Heald. Moreover the aircraft industry is just one of many where new Heald equipment is paying off *right now* in terms of lower costs, larger profits and better product. May we serve you, too?

it PAYS to come to Heald

Booth 902
AT THE MACHINE TOOL SHOW

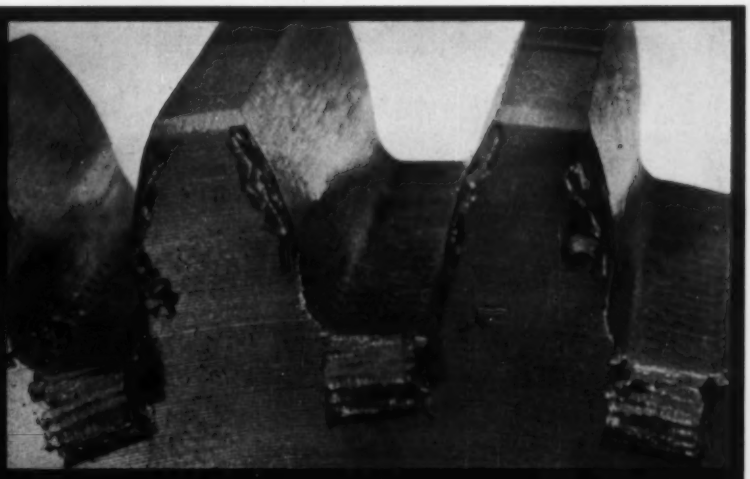
THE HEALD MACHINE COMPANY
WORCESTER 6, MASSACHUSETTS

HEALD

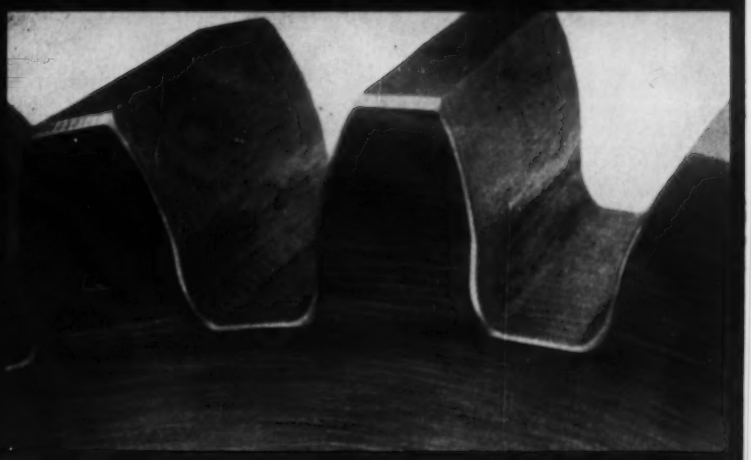
Branch Offices Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

Osborn Brushamatic

. . . rough to finish in one operation



BEFORE BRUSHING. Edges have heavy burrs. Sharp corners permit high stress concentrations . . . possible sources for failure.



AFTER BRUSHING. Burrs are gone . . . smooth, uniform blend on junctures of gear face and involute increase tooth strength.

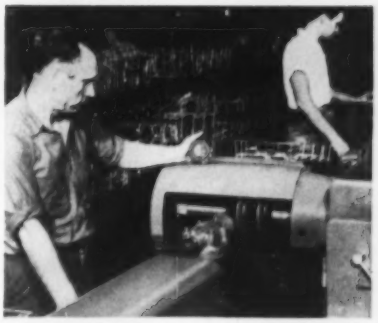
At the push of a button, you can now blend surface junctures on gear teeth . . . at the same time burrs are removed. Each gear tooth is uniform in quality. Production is less costly because it's simpler, faster.

Gears finished on Osborn Brushamatics are stronger, more dependable. By removing sharp corners, stress concentrations are avoided. Thus, there is less chance for failure in severe service.

Your operator simply loads and unloads the work. Brushamatic rotates the piece against revolving brushes on preset time cycles.

An **O**sborn **B**rushing **A**nalyst can show you how to put Brushamatic to work for you. One machine can handle a large variety of work . . . is easy to set up from job to job. Call or write *The Osborn Manufacturing Company, Dept. G-33, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

*Trade-Mark



OSBORN BRUSHAMATIC*. *Saves over 1000 manhours every year. Capable of handling over 2000 parts a day.*

Osborn Brushes

OSBORN

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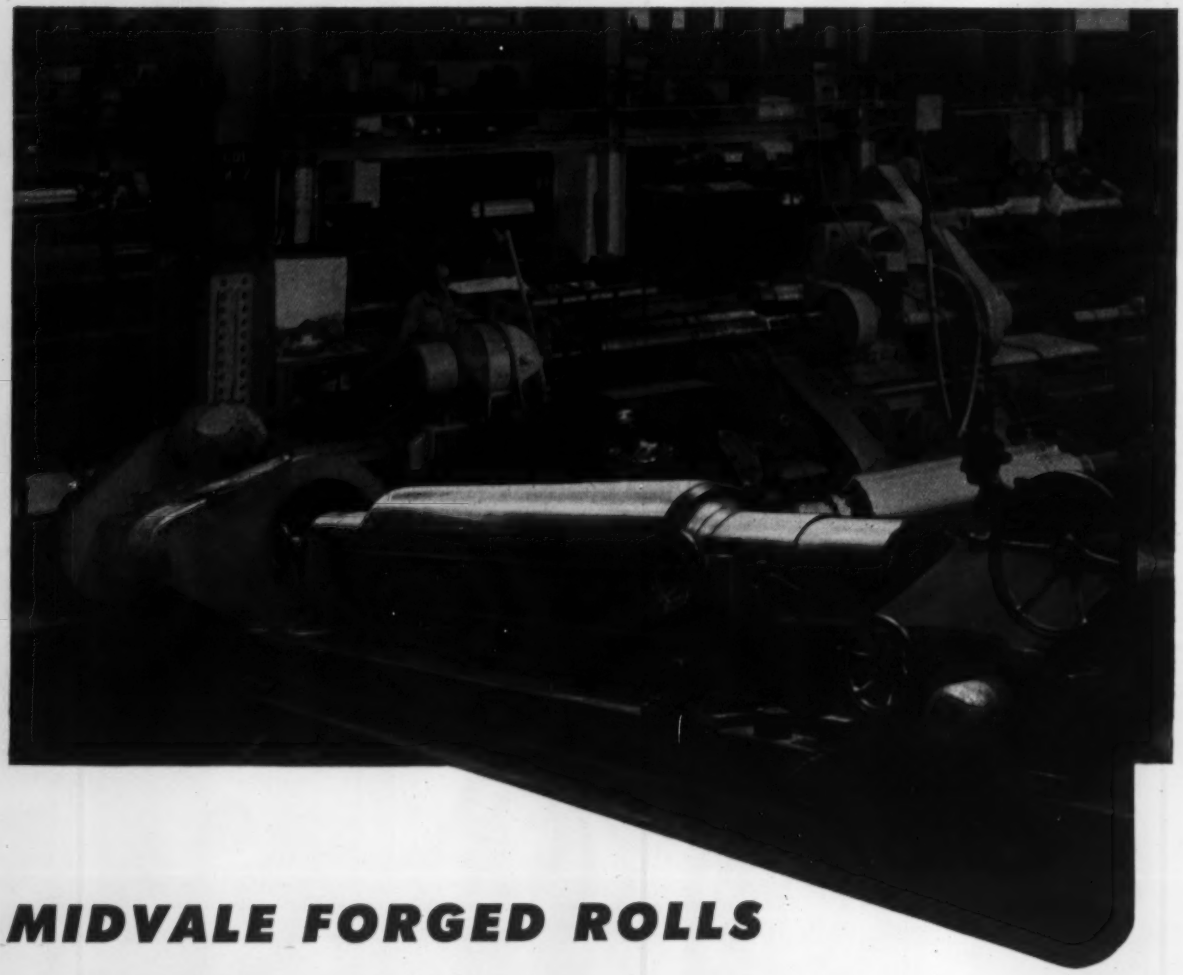
BRUSHING MACHINES • FOUNDRY MOLDING MACHINES



MIDVALE FORGED ROLLS

TOUGH ROLLS TO BEAT AT THE FINISH

From the furnace to finished grind Midvale Forged Steel Rolls are made with greater durability to provide a finer finish for longer runs.

Half a century of roll making experience skillfully shapes rolls under the right size press for the particular roll . . . produces the maximum in grain refinement. Careful heat treatment gives them the required surface hardness, up to 105 Shore, and endurance qualities underneath. A series of inspections, including sonic testing, approve it for service.

Do you need high quality, longer lasting forged rolls in your mill? Whether they are for strip or sheet mills . . . precision rolling of copper, aluminum or other metals, let Midvale roll specialists show you why you can be sure of a good finish when you start with Midvale Forged Steel Rolls.

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Offices: New York, Chicago, Pittsburgh, Washington, Cleveland, San Francisco

MIDVALE

FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS

STEEL
The Metalworking Weekly

JUNE 20, 1955
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BRIDGEPORT (Montgomery County), PA

behind the scenes

Beaming Editor

In Washington recently at a NIAA meeting Irwin H. Such, editor of STEEL, reached out with eager hands and accepted a bronze plaque awarded for editorial achievement by *Industrial Marketing* in the wake of its 17th Annual Business Paper Editorial Competition. G. D. Crain Jr., publisher of *Industrial Marketing*, is pictured handing the plaque to Mr. Such, who confessed later that he was so nervous he almost dropped it.

We wouldn't blame him a bit if he had. That bronze plaque is emblematic of first award, and was won by STEEL because its Program for Management series was judged to be the best series of articles published by any business publication in 1954.

It Was a Crime

The mighty stirrings within the ranks of unions and manufacturers these days recall some old English law: Until 1824 an English workingman was criminally liable if he combined with his fellow workmen to raise wages or shorten hours, even if there were no strike. Moreover, until 1871 members of a union who persuaded employees to leave work were criminally liable, even if the persuasion were peaceful and unattended by picketing. Tune in next week for more early labor laws.

Wolfgang's Target

When Sylvester went back to eating pizza pies, he found that interest had accrued at the rate of 3½-per cent. Charles F. Cintalon, Edwin F. Guth Co., St. Louis, was first with the answer. Now, here's one about Wolfgang Crunch. Wolfgang was crazy about darts, so he sawed a disc from a slab of plywood and painted it to resemble a target. Of the total area the bulls'-eye was 13 per cent; the inner ring, 11 per cent; middle ring, 23 per cent; outer ring, 53 per cent. The outer circumference of the middle ring was 22½-in. Wolfgang's wife, Valkyrie, wanted to know the diameter of the bulls'-eye and the width of the rings, but he wouldn't tell her. Can you help her?

Shrdlu

(Metalworking Outlook—Page 53)

Insul-Mastic

PROTECTIVE COATINGS
. . . the tough skin of industry

We can show you INSUL-MASTIC Coatings that have been preventing corrosion for 10, 12 and 15 years. Many of these applications are in industrial plants where corrosive fumes and vapors have been known to eat through other coatings within a very short time.

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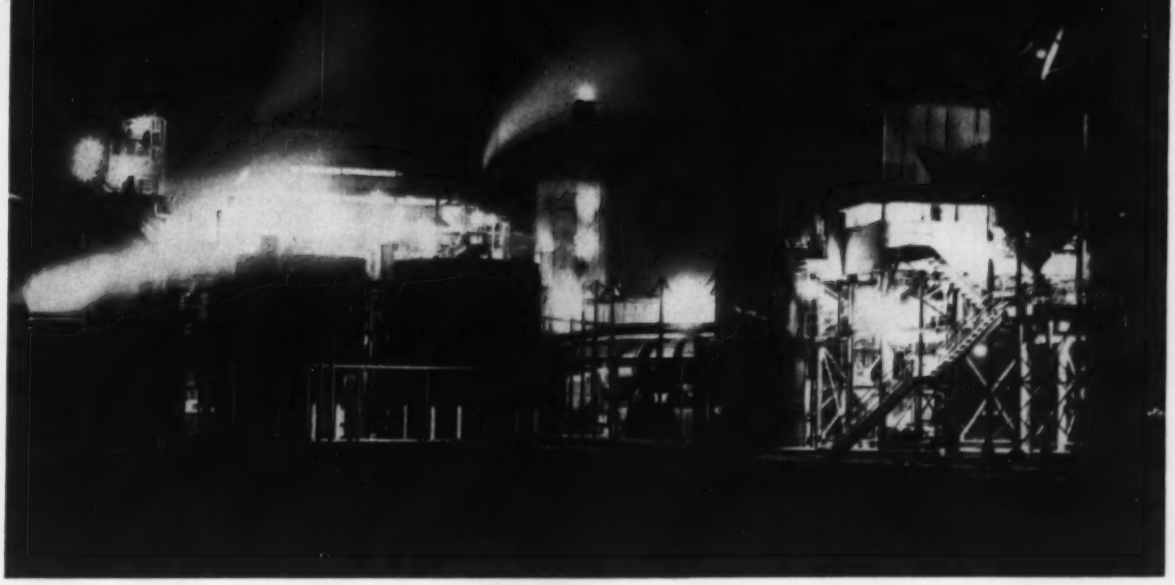
It pays to think *first* of the coatings that *last* . . . INSUL-MASTIC.



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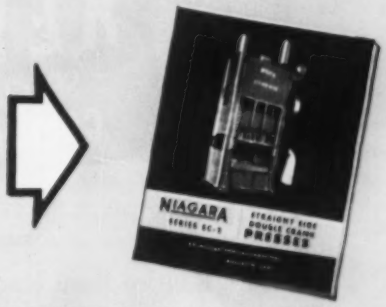

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On your next recessed head or other difficult cold heading job, try "Special Processed" Wire. See your Keystone representative or write for more information.

LETTERS
TO THE EDITORS

Steel Scrap Procurement

We are interested in obtaining a small quantity of SAE4615 steel scrap. Can you tell us the name of the executive officer and the address of the Institute of Scrap Iron & Steel Inc?

Clement Hackney
Purchasing Agent
Evinrude Motors
Milwaukee

• *Edwin C. Barringer is executive vice president of the Institute of Scrap Iron & Steel Inc., 1729 H St. N. W., Washington 6, D. C.*

Company Observation

Your article, "Job Shops: Six Paths to Profit" (May 2, page 73), is a stimulating story which I have enjoyed reading.

The presentation of case stories always is realistic. Your emphasis of management as an important ingredient to success is significant.

I am certain that the experience of these selected companies has been, or can be, duplicated by the thousands.

You are doing a sound job for the smaller manufacturer through the publication of imaginative, yet practical articles such as this one.

Wendell B. Barnes
Administrator
Small Business Administration
Washington

Galvanized for Action

We find your article, "Galvanizing Goes Continuous" (May 30, page 107) most instructive.

S. H. Arden
Purchasing Dept.
Kaiser Steel Corp.
Detroit

This certainly covers the subject in an excellent manner.

G. R. Mahon
Weirton Steel Co.
Division of National Steel Corp.
Cincinnati

R.S.V.P.

Thanks are in order for the fine magazine you are sending me. We of Convair appreciate the timely articles and processing news always found in STEEL.

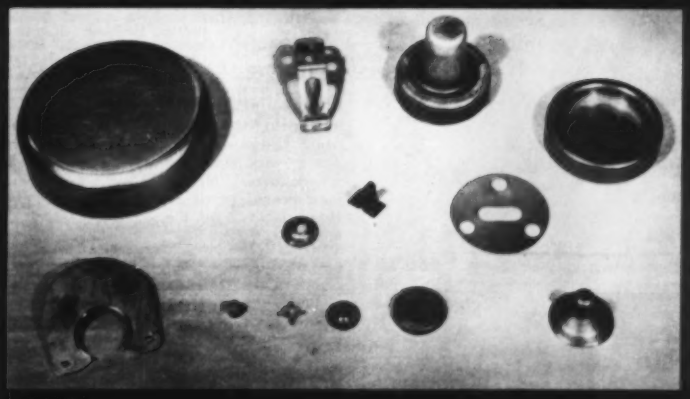
K. A. Day
Manager, B-58 Program
Consolidated Vultee Aircraft Corp.
Ft. Worth, Tex.

Aid to Screwdrivers

In the article, "Screwdriver Makes Comeback" (May 30, page 76), you tell about a new screw-feeding device for power screwdrivers. You give the product name as Pneuma-Serve, but

(Please turn to page 12)

DRAWING KOVAR, a special alloy steel that's considered difficult to draw, is easy with this 35-ton Denison Multipress. And, set-up takes only a few minutes.



Some of the various electronic parts formed by Multipress at Amperex

Quick die changes with **DENISON MULTIPRESS**® saves manhours

A way to cut costs on short-run metal-forming

SHORT RUNS, frequent die changes. That was the production problem at Amperex Electronic Corporation, Hicksville, New York.

Now, Denison hydraulic Multipress makes set-ups faster than possible with fixed-stroke presses. With Multipress inching control, the ram can be inched to the convenient point for attaching dies. And the smooth, variable hydraulic stroke gives set-up men perfect control of the ram.

Amperex uses three Multipresses for blanking, piercing, forming, drawing and broaching steel and nonferrous metals . . . to produce a wide variety of shapes and sizes.

This is one example among many where Multipress is cutting costs in the 1-to-75-ton pressure range. For help on your particular application, call a Denison Hydraulic Engineer.

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an ACCO product

ACCO's Great New Chain...

ACCOLOY X-WELD 125

• *At last*—a chain with welds as strong or stronger than the material . . . welds that won't break when links are bent sharply . . . welds made with two projecting lugs that absolutely prevent dangerous kinking of the chain . . . welds that provide 2¼ times the welded area found in normal flash or butt-welded links. **Accoloy X-Weld 125** Chains hang straight as a die. Every link is perfectly formed!

Accoloy X-Weld 125 Chain has almost countless uses: Slings, bundling, towing, general utility chains . . . It can be furnished in special analyses and heat treatments to provide greatly extended life and use on **tough jobs** . . . corrosive jobs . . . abrasive jobs . . . hot jobs. Specify **Accoloy X-Weld 125** for your next chain job for a new concept of chain performance, economy and value. Available in ¼", ⅜", ½", ⅝" and ¾" sizes.

• Ask our nearest district office for further information on ACCOLOY X-WELD 125 CHAIN, *or write the American Chain Division, York, Pa., for descriptive bulletin.*

PATENT APPLIED FOR

The Secret is in the Weld!

This Accoloy X-Weld 125 link was ground and etched to show its big welded area —2¼ times the size of welded area possible with other welding processes. This means more than double the security at the weld—and only X-Weld has it!

ACCO

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AMERICAN CHAIN & CABLE

York, Pa., Atlanta, Boston, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

for Better Value

LETTERS

(Concluded from page 10)

no address. We want more information. Where can we get it?

W. E. Bowes
Purchasing Agent
Aetna Steel Products Corp.
Pottsville, Pa.

• *Write Pneuma-Serve Inc., P. O. Box 2805, Cleveland, O.*

Nickel Scarcity

Please send me three copies of the article, "Nickel Shortage Until 1958" (June 6, page 47).

G. A. Baker
Vice President
Duriron Co. Inc.
Dayton, O.

We would appreciate three copies . . .

R. H. Cromwell
Vice President
Electro Manganese Corp.
East Orange, N. J.

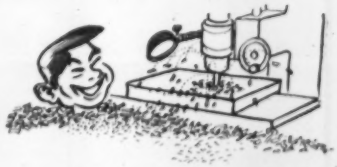
Milling Process Changes

Several persons in our organization find the article, "Milling Goes Chemical" (May 16, page 120), useful and informative. May we have permission to reprint 350 copies for internal circulation?

E. J. McNamara
Publicity Department
Behr-Manning
Division of Norton Co.
Troy, N. Y.

• *Permission granted.*

Machining Can Be Easy



In the article, "More Muscles in Steel" (April 25, page 96), a picture shows machined SAE 4340 parts at a hardness level of Rockwell C 56.

In the past we have had difficulty in machining (drilling, reaming, tapping) any part above the hardness of Rockwell C 44. We were wondering from whom we might get more information about the tooling used in these machine operations.

D. C. Goldberg
Section Engineer, Metallurgy
Aviation Gas Turbine Division
Westinghouse Electric Corp.
Kansas City, Mo.

• *We understand that equipment for machining these superstrength steels is rugged, equipped with plenty of horsepower and firmly anchored. For more information, write R. E. Greenough, vice president of engineering, Cleveland Pneumatic Tool Co., 3781 E. 77th St., Cleveland, O.*

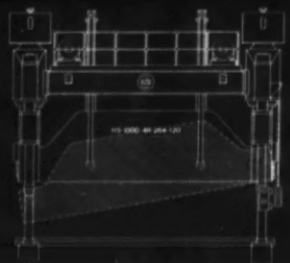
Welders Like Solution

We are extremely pleased with your splendid article, "Resistance Welding May Be the Answer" (May 30, page 70). We wish to supply copies to all our members. Please send 30 tear sheets.

R. Bruce Wall
Resistance Welder Manufacturers Association
Philadelphia

NAVAL SHIPYARDS STEP UP PRODUCTION WITH...

BLISS 1000-TON KEEL BENDERS



Rocking action illustrated: slide comes down on work and then rocks back and forth to bend it into desired shape. Key to this smooth rocking action is the fact that weeks were spent in hand-finishing the mirror-like seats at the ends.

At Boston Naval Shipyard, this 1000-ton Bliss keel bender shapes hull, bulkhead and keel plates up to 22 feet long and 10 feet wide—faster, easier and at less cost than previous installations. And here's why . . .

This press operates like a press brake, but has a unique and different slide (ram) action—it can be moved up or down on an angle and rocked back and forth. With this "skewing" action and properly designed dies, this hydraulic press can form the many different hull and keel plates needed.

The "skewing" action is achieved this way: the pressing beam, while rigidly secured in the slide housings, is flexibly mounted in the crossheads on mirror-like ball seats. This permits the full action desired and gives the press its versatility. The result is a wide choice of pressing combinations and greatly increased production.

In fact, the Navy reports it's "a decided improvement" over older units. Recently, a twin bender was installed at the Charleston (S. C.) Naval Shipyard.

These keel benders, though unique, are actually only recent examples in our history of tackling the difficult in press building. If you are faced with an unusual press engineering problem, why not let a Bliss representative give you the benefit of our collective experience.

E. W. BLISS COMPANY, Canton, Ohio
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E. W. Bliss (England) Ltd., Derby — E. W. Bliss Co. (Paris), France

Hardworking backhoe provides a tough test for Pittsburgh tubes . . .

First step in production of hydraulic cylinders at Hydreco Division of The New York Air Brake Co. is to cut Pittsburgh Steel tubes to correct length and drill holes for pipe fittings.

Where Steel Makes Dirt Fly

■ Hydreco Speeds Machining Operations, Reduces Production Costs By Using Pittsburgh Tubes To Make Hydraulic Cylinders For Power Backhoes

Eight hard-working hydraulic cylinders, operating smoothly in unison, make the dirt fly when a powerful Wain-Roy Backhoe takes over on an excavation job.

Oil hydraulic cylinders, which are giving industry a lift in scores upon scores of applications, get one of their most rugged tests in this sturdy backhoe. That's because the cylinders are in almost constant use throughout the working day. They're always exposed to the elements—battling sticky mud one day and gritty dust the next.

Producing hydraulic cylinders for long useful life on a tough job like this is an exacting business. It requires the best of materials and painstaking workmanship.

Quality materials and precise craftsmanship are stressed at the Cleveland, Ohio, plant of Hydreco Division, The New York Air Brake Company, where thousands of cylinder assemblies are made of Pittsburgh cold drawn, stress-relief annealed tubes for the Wain-Roy Backhoe.

Hydreco picked Pittsburgh Steel as its major supplier of tubes because Pittsburgh tubes cut production losses and speed up grinding, turning and honing operations.

Why? Because they're held to close tolerances. They're straight and uniformly concentric, have good machinability, top weldability and a smooth, clean surface. All this means Hydreco workers have less metal to cut away and fewer scrapped tubes.

The variety of operations required to convert tubes into fin-

(Advertisement)

The completed spud assembly is now ready for hand welding onto the cylinder tube. This cylinder, when completed, will be used to raise and lower the boom on a backhoe.

Piston rods for hydraulic cylinders get a very high polish from a continuous crocus cloth belt. The piston rod being polished here is for a 38½-inch long cylinder.

ished hydraulic cylinders demonstrates how use of good tubing reduces shop costs while improving the quality of the finished product.

Hydreco first cuts Pittsburgh tubes into proper lengths, and faces off the ends. Hydreco can use standard Pittsburgh tubes because they have close dimensional accuracy. For the backhoe, MT1015 tubes, with a 10 to 20 carbon spread, fill the bill.

The tubes range in outside diameter from 2 inches to 7 inches, depending on whether the tube will be used to swing the boom, raise and lower the dip stick, dump the shovel or to actuate the two stabilizers which give the backhoe a firm footing. All wall thicknesses are finished to a quarter-inch.

After counter drilling tube ends, the pipe fittings (or spuds) are automatically welded in place. Good weldability of Pittsburgh tubes permits fast operation without warping.

Honing follows, the tubes get finished machining and then plug ends are welded in place. If no further machining is required, cylinder tubes and pistons are assembled and placed on a test rack where they are operated under pressures of 1,500 pounds per square inch.

The high tensile strength built into the tubes and their freedom from seams and other defects result from skilled know-how on the part of men in the Pittsburgh Steel tube mills who use the best available equipment. That gives the final users assurance of long and satisfactory service.

Hydreco depends on Pittsburgh Steel for tubes used in many additional applications. The company has a well established reputation for producing engineered, custom-made hydraulic cylinders. Most Hydreco customers for hydraulic assemblies have special requirements for space, mountings and hydraulic connections. The company produces these engineered cylinder assemblies, single or double acting, in sizes ranging from 1½ inches in diameter to 8 inches.

If mechanical tubing fits into your picture, it will pay you to investigate how Pittsburgh tubes can speed your operations while lowering costs. Contact the nearest district sales office. A Pittsburgh Steel representative may have money saving suggestions for you. Or write for the new tubing handbook which will give you complete information.

Pittsburgh Seamless Mechanical Tubing is also available from:

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Drummond McCall & Co., Limited
Montreal, Quebec, Canada

Edgcomb Steel Company
Philadelphia, Pennsylvania

Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.

Mapes & Sprowl Steel Co.
Union, New Jersey

Metal Goods Corporation
St. Louis, Missouri

Miller Steel Company, Inc.
Hillside, New Jersey

A. B. Murray Co., Inc.
Elizabeth, New Jersey

C. A. Russell, Inc.
Houston, Texas

Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois

Solar Steel Corporation
Cleveland, Ohio

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FACILITATES COLD FORMING OPERATIONS

The drawing of wire, bars, tubing, stampings, shells, shell cases, cold heading, and many other cold forming operations—including the cold extrusion of steel—are greatly facilitated by the application of a "Granodraw" zinc phosphate coating and a suitable lubricant prior to working.

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CUT COSTS
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(AND CASE HARDENING)

PRODUCTION UP 350% IN
45% Less Floor Space!

Bearing races and thrust washers are carburized 0.065" case depth in 6 hours at 1700°F in two Ajax salt bath carburizing and tempering lines totaling 6 furnaces, and occupying 45% less space than 21 separate batch type furnaces previously used. Six men handle 3½ times as many races as were previously handled by twelve men.

Costs Cut 60%!

390 pounds of metal body screws per hour are case hardened (0.004" to 0.010") in a single Ajax salt bath furnace no larger than your desk. Bath working dimensions are 36" by 12" by 16". Only 15 to 35 minutes immersion at 1600°F are required — depending on desired case depth. Salt bath carburizing greatly reduced rejects and eliminated a pickling operation.

Tractor drive pinions are selectively carburized in this typical Ajax electric salt bath installation. By immersing only the gear in the bath, carburization is obtained where desired and the unheated portions remain unaffected.

Ajax electric salt bath liquid carburizing is the **fastest**, most **economical** method of producing a specified case depth.

Faster Heating . . . Closer Control—A closely controlled case of 0.040" can readily be produced in 2 hours at 1750°F.

Low Costs—*First cost is only 1/2 to 1/5 that of any other production carburizing system!* Much less floor is needed. Maintenance costs are low.

Less Distortion — Temperature uniformity (within 5°F) minimizes distortion . . . assures less finish grinding . . . permits more shallow case depths.

Extreme Flexibility and Simplicity—Several batches may be case hardened simultaneously —each to a different case depth.

Combines with Other Operations — Both carburizing and brazing can be done in one heating of the work. Carburizing can also be combined with martempering.

No "oxygenation" of the case —No pitting and spalling.

Selective Carburizing Simplified —Immerse only the portions of work to be treated, or copper plate the areas that do not require carburizing.

Eliminates Usual Reheating Operation—Work is quenched directly from carburizing bath.

COMBINATION CARBURIZING-MARTEMPERING Saves 35%!

One operator runs a mechanized Ajax line that carburizes and martempers 65 outboard motor crankshafts per hour. Case depth of 0.040" is quickly obtained in a 1760°F bath. Besides an over-all savings of 35%, a copper plating operation and a straightening operation were eliminated. Rejects averaging 4% previously were practically eliminated.

Selectively CARBURIZED AND MARTEMPERED!

Only the teeth and internal spline of this AMS6260 gear are carburized to a 0.035 inch case with a 4½-5 hour immersion. Copper plating of the balance of the piece inhibits carburization. After carburizing and air cooling, gear is reheated and martempered at 500°F for 3½ minutes. Final hardness is Rc 62/63.

Write for Catalog 116B and documented case histories of carburizing installations.

Send Your sample parts to the Ajax Metallurgical Service Laboratory for processing. No cost or obligation.

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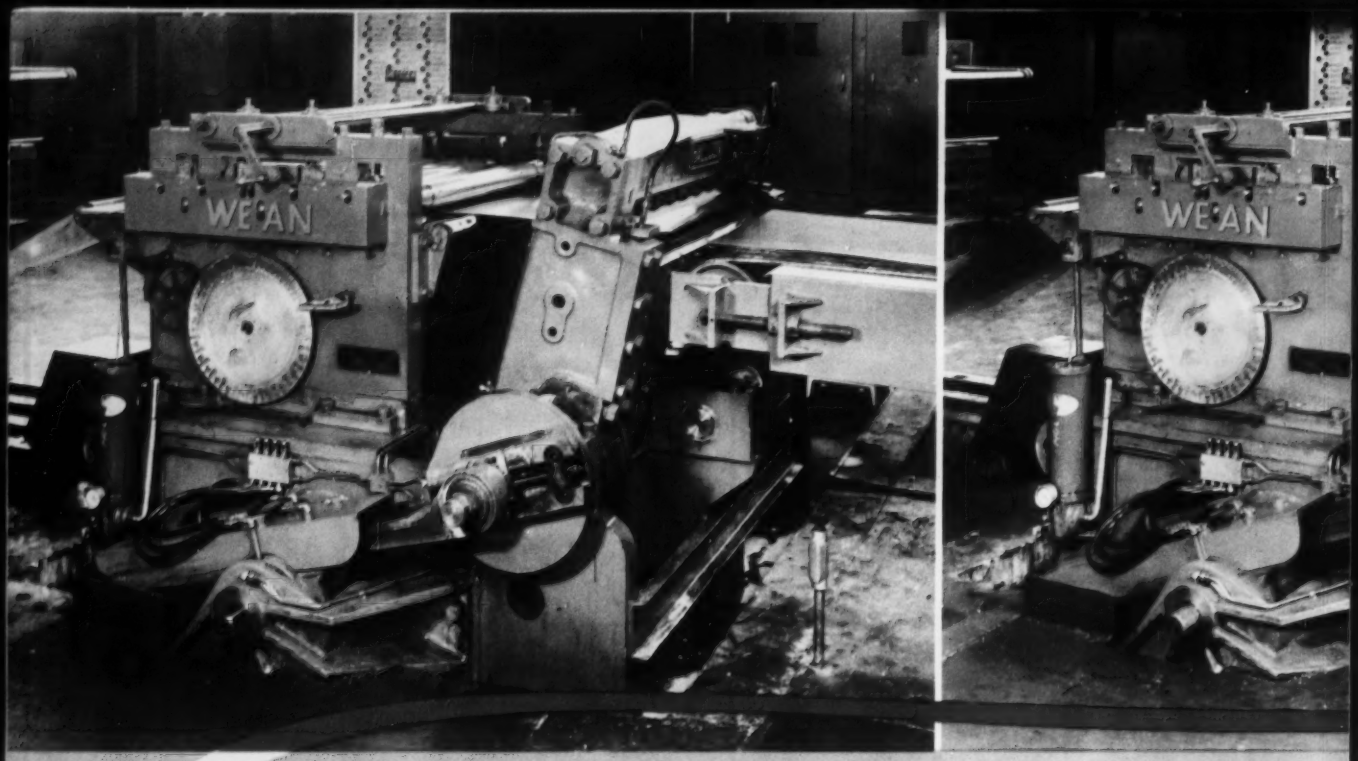
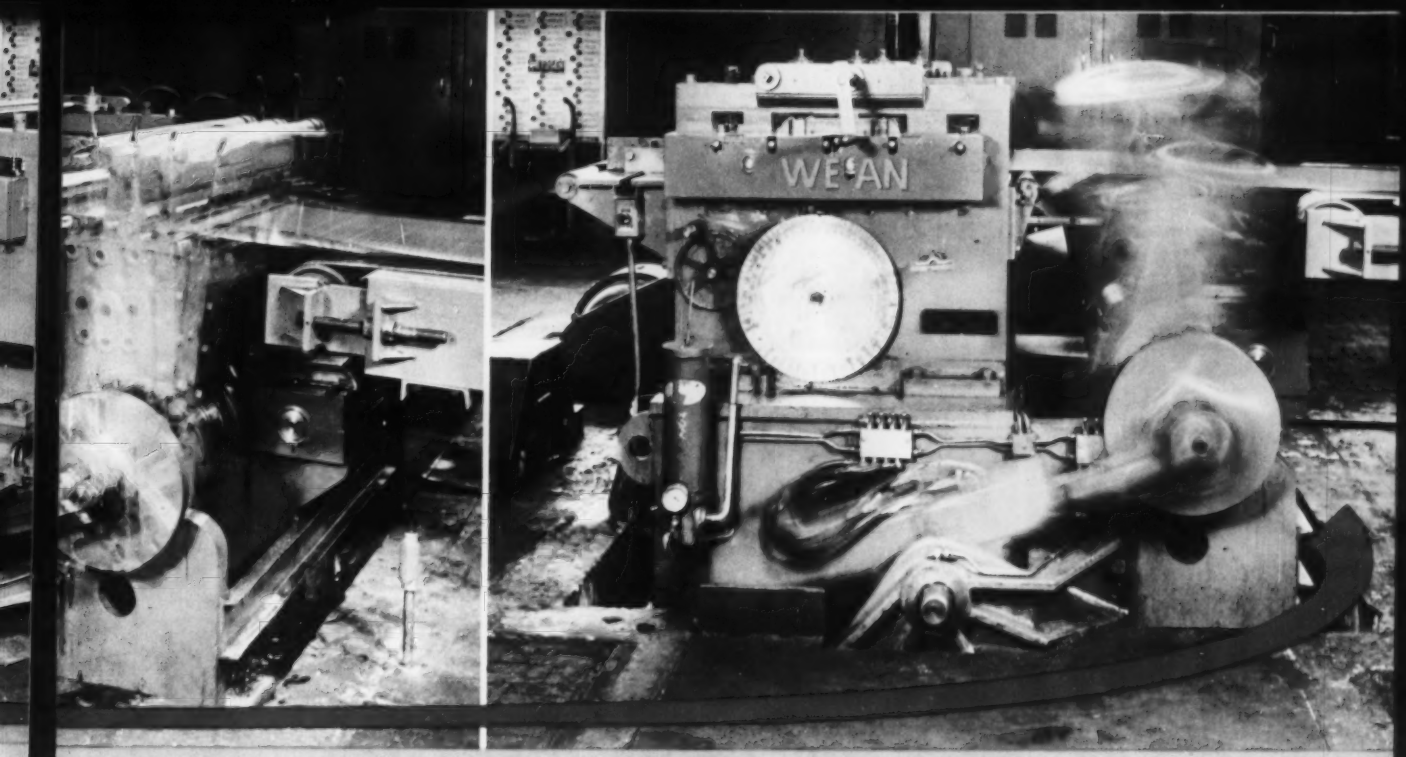


Here's the Amazing Wean That Makes 100 Cuts Per Minute

Saves Bulk Steel Users $20 a Ton

Wean salesmen have a quick and painless method for actually showing you, using your own figures, how, by purchasing steel in coil form, you can save in the neighborhood of $20 per ton on your steel costs. This is an offer you can't afford to overlook. If your plant is situated in an area where a Wean Line is operating we invite you to see it in operation ... talk with the people who operate it ... and we're sure you'll want this great system in your own plant.



Flying Shear Line
to Resquared Tolerance

One-hundred cuts per minute to resquared tolerances . . . that's what users of the amazing new Wean Equipment Flying Shear and Slitting System are getting. That's why, if you are using steel in sheet form, it's important to you to get all the facts.

By purchasing steel in coil form you minimize the mill extras — that sometimes amount to more than $1.00 per hundred weight. You reduce considerably both the personnel required to handle and inventory large steel stocks and the space needed to store various cut sizes of steel of the same gauge and analysis.

And this Wean System provides you with faster production. Here is a shear line that will cut to tolerance at the rate of 100 times per minute. Measure this against your present squaring-to-multiples rate and you'll quickly see how a single Wean line can keep a bank of high speed presses in constant operation.

SEE IT IN ACTION . . . YOU'LL AGREE

There's no comparison! The Wean Combination Slitting and Shearing Line is absolutely the last word in speed, precision and automatic operation. Before you buy let a Wean Equipment man show you one of these lines in operation. Talk with the operators. You'll be convinced. Simply contact the Wean office nearest you. They're listed below.

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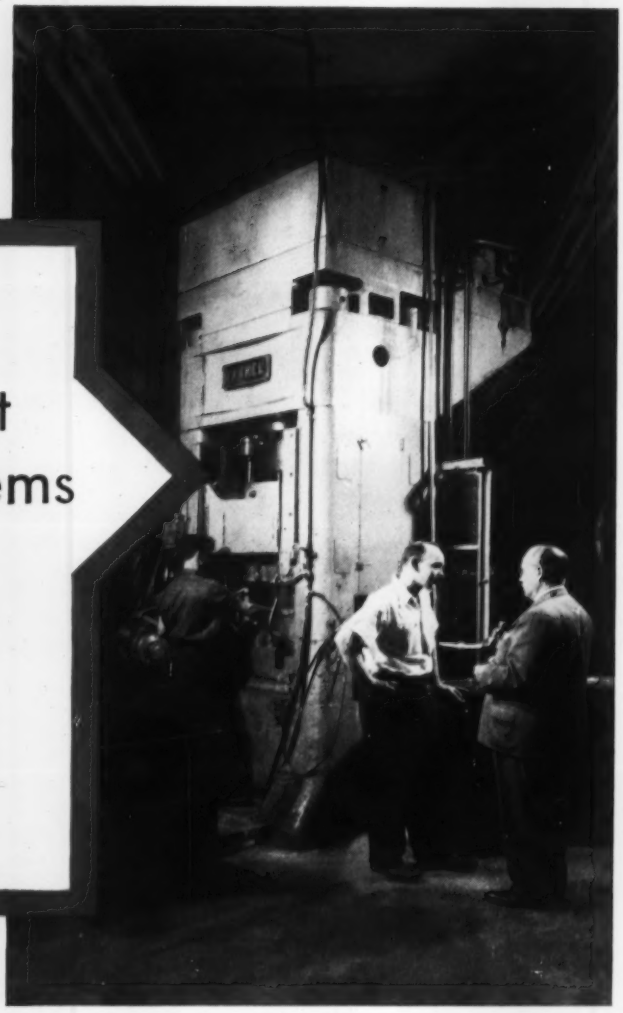
COMBINATION SLITTING and SHEARING SYSTEMS

ease your hydraulic equipment maintenance problems with GULF HARMONY OIL



Use a hydraulic oil that has excellent resistance to oxidation, high film strength, outstanding rust preventive and anti-foam properties—qualities which hydraulic engineers consider to be the most important when selecting a hydraulic lubricant —and you will have fewer maintenance problems and less down time.

Gulf Harmony Oil has all of these qualities. It prevents the formation of sludge deposits and maintains its original viscosity over long periods of time. It also protects hydraulic equipment against excessive wear, even under severe conditions of pressure, speed, and temperature. And it protects against the damaging effects of harmful rust.

So if you have maintenance problems with your hydraulic equipment, call in a Gulf Sales Engineer. He will recommend the right grade of trouble-preventing Gulf Harmony Oil for your equipment. Contact him today at your nearest Gulf office.

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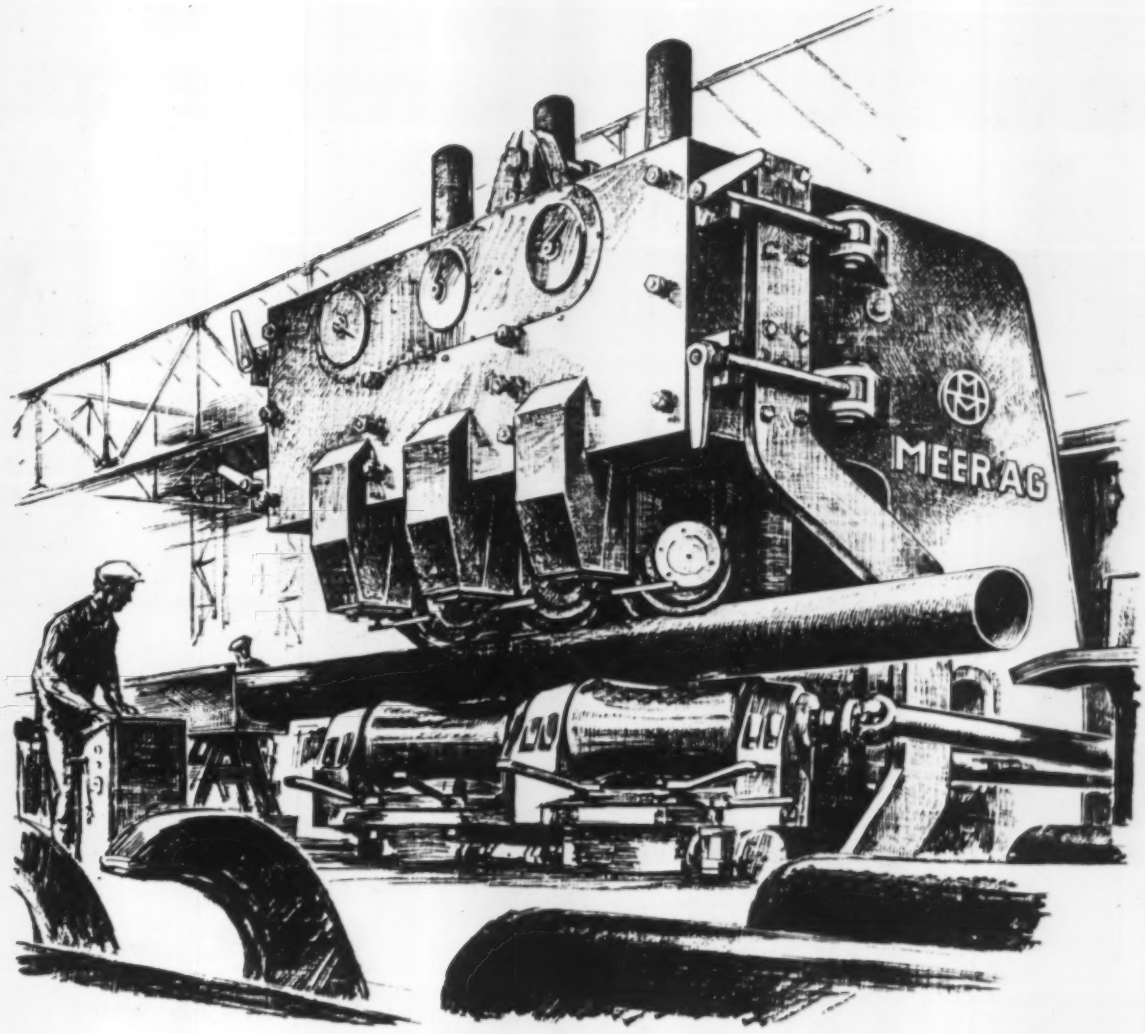

New Straightener Line Speeds Mill Production

Mannesmann-Meer's new line of vertical skewed roll rotary straighteners handles a wide range of tubing and bar stock sizes in one single pass at high production speeds. Special hyperbolic shape of straightener rolls provides for extra length of contact between roll surface and work piece, improves the surface quality and prevents yield marks which ordinarily result when stressing material through the elastic limit. Even thin-walled tubing made of non-ferrous metals and liable to easy fracture are straightened with best result. The close roll spacing made possible by this new design combined with heavy anti-friction roll bearings accomplishes the best possible straightening effect, even on high strength steel tubes and bars. This new straightener incorporates the most advanced design yet developed and comes as a result of the combination of

- CREATIVE ENGINEERING
- DESIGN EXPERIENCE
- OPERATING BACKGROUND
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which is available only from Mannesmann-Meer. Put us to work today on your straightening problems.

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WORLD SPECIALISTS IN HIGH-SPEED TUBE MILL MACHINERY

Automatic welding at Solar Aircraft

CRUCIBLE stainless steel welding wire

for faster, cleaner, uniform weld quality

Save time and money . . . get better weldments with Crucible stainless steel welding wire. For Crucible welding wire is made by *steelmen* for optimum performance on the job.

You can get these superior welding wires for any type of automatic welding . . . in most stainless grades and sizes . . . and in spools, coils and cut lengths.

They're all quickly available through your nearby Crucible warehouse. Next time you need stainless welding wire call Crucible. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 30, Pa.*

CRUCIBLE

first name in special purpose steels

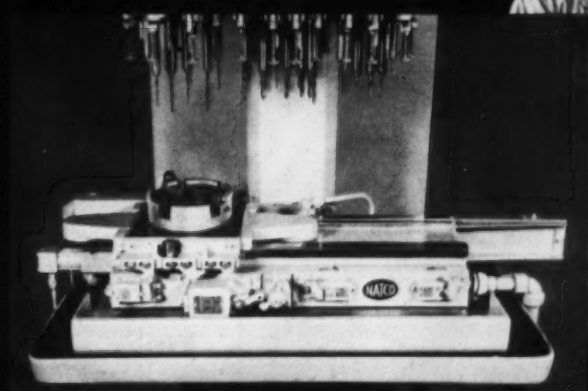
Crucible Steel Company of America

NEW NATCO DRILLER DOES WORK OF THREE MACHINES

...DRILLS, CHAMFERS AND TAPS AUTOMATICALLY!

NATCO H-6 LIGHT SENSITIVE, ADJUSTABLE MULTI-SPINDLE DRILLER AND TAPPER WITH...

3 POSITION AUTOMATIC FIXTURE SLIDE



THREE POSITION AUTOMATIC FIXTURE SLIDE IN DRILL POSITION.

TYPICAL FEED CYCLE

POSITION No. 1—DRILL	POSITION No. 2—CHAMFER	POSITION No. 3—TAP
Load Part	Rapid Traverse	Rapid Traverse
Rapid Traverse	Feed Forward	Feed Forward
Feed Forward	Rapid Reverse	Feed Reverse
Rapid Reverse	Index to Position No. 3	Rapid Reverse
Index to Position No. 2		Index to Position No. 1

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CHICAGO, ILL.
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RICHMOND, INDIANA

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CECO-DROP does more forging per blow... makes more forgings per hour

The piston-lift gravity drop hammer with short stroke control

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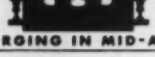
CHAMBERSBURG ENGINEERING CO.

Builders of THE IMPACTER



"FORGING IN MID-AIR"

CHAMBERSBURG, PENNSYLVANIA

"To the success of your mechanism"
WALLACE BARNES COMPANY
BRISTOL, CONNECTICUT
THE WILLIAM D. GIBSON COMPANY
1800 CLYBOURN AVE. CHICAGO 14,
RAYMOND Manufacturing COMPANY
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BARNES-GIBSON-RAYMOND
40300 PLYMOUTH RD. PLYMOUTH, MICH.
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DIVISIONS OF ASSOCIATED SPRING CORPORATION
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F. H. MANROSS AND SONS CO.
BRISTOL CONNECTICUT
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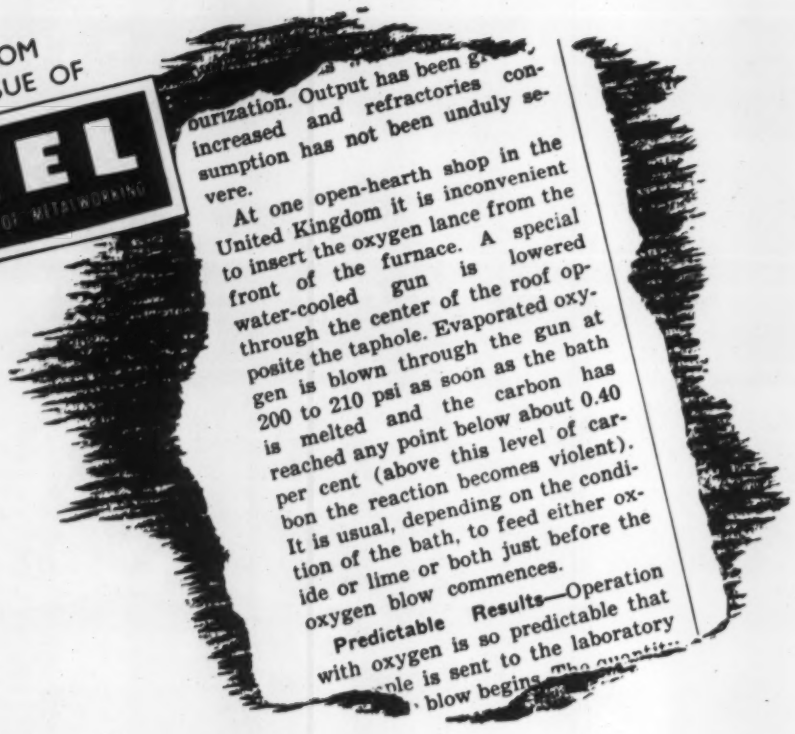
HAMILTON CANADA

EXTRACT FROM MARCH 21st ISSUE OF

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



ourization. Output has been g... increased and refractories consumption has not been unduly severe.

At one open-hearth shop in the United Kingdom it is inconvenient to insert the oxygen lance from the front of the furnace. A special water-cooled gun is lowered through the center of the roof opposite the taphole. Evaporated oxygen is blown through the gun at 200 to 210 psi as soon as the bath is melted and the carbon has reached any point below about 0.40 per cent (above this level of carbon the reaction becomes violent). It is usual, depending on the condition of the bath, to feed either oxide or lime or both just before the oxygen blow commences.

Predictable Results—Operation with oxygen is so predictable that ...mple is sent to the laboratory ... blow begins. The quantit...

This describes the

P.T. OXYGEN GUN

PATENT APPLIED FOR

developed and perfected by THE STEEL COMPANY OF WALES LIMITED for use in open hearth furnaces for rapid decarburisation by jet impingement of oxygen by means of a gun centrally mounted in the furnace roof.

Ten points of advantage :—

Greatly increased rate of carbon removal

Increased production

Reduction of fuel consumption

- Push button control for entry and withdrawal
- No interference with charging
- No interference with tapping
- No reduction in life of roof and lining
- Gun life of 80 or more operations regularly obtained
- Oxygen delivery up to 60,000 cubic feet per hour or more

Proved in use

This type of gun is in regular use on eight 225 net ton furnaces in the Abbey Works Melting Shop of The Steel Company of Wales at Margam. It will also be used on the four 250 net ton furnaces now being installed.

Enquiries should be addressed to:—

The Secretary and Comptroller

THE STEEL COMPANY OF WALES LIMITED

ABBEY WORKS · PORT TALBOT

SOUTH WALES · U.K.

CALENDAR
OF MEETINGS

June 19-22, Drop Forging Association: Annual meeting, Grove Park Inn, Asheville, N. C. Association's address: 605 Hanna Bldg., Cleveland 15, O. Secretary: Edgar L. Harden.

June 19-23, National Association of Cost Accountants: Annual meeting and exhibit, Waldorf-Astoria hotel, New York. Association's address: 505 Park Ave., New York 22, N. Y. Secretary: A. B. Gunnarson.

June 19-23, American Society of Mechanical Engineers: Semiannual meeting, Hotel Statler, Boston. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

June 20-23, American Electroplaters' Society: Annual meeting and exhibit, Public Auditorium, Cleveland. Society's address: 445 Broad St., Newark, N. J. Secretary: P. P. Kovatis.

June 23-26, American Coal Sales Association: Annual meeting, the Greenbrier, White Sulphur Springs, W. Va. Association's address: 1625 Eye St. N.W., Washington, D. C. Executive vice president: W. W. Bayfield.

June 26-23, Alloy Casting Institute: Annual meeting, the Homestead, Hot Springs, Va. Institute's address: 32 Third Ave., Mineola, N. Y. Executive vice president: E. A. Schoefer.

June 26-July 1, American Society for Testing Materials: Annual meeting, Chalfonte-Haddon hall, Atlantic City, N. J. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

June 27-29, American Nuclear Society: Annual meeting, Pennsylvania State University, State College, Pa. Information: Professor W. W. Miller, Pennsylvania State University.

June 27-July 1, American Institute of Electrical Engineers: Summer general meeting, New Ocean house, Swampscott, Mass. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

June 28-30, Steel Shipping Container Institute Inc.: Summer meeting, Hotel Pierre, New York. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

July 12-14, Western Plant Maintenance Show: Pan Pacific Auditorium, Los Angeles. Information: Clapp & Poliak Inc., 759 Monadnock Bldg., San Francisco 5, Calif.

July 21-23, Truck-Trailer Manufacturers Association Inc.: Summer meeting, Sheraton-Cadillac hotel, Detroit. Association's address: 710 Albee Bldg., Washington 5, D. C. Managing director: John B. Hulse.

Aug. 15-17, Society of Automotive Engineers Inc.: West coast meeting, Multnomah hotel, Portland, Oreg. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Aug. 22-23, Stanford Research Institute and National Industrial Conference Board: Symposium on electronics in automatic production, Sheraton-Palace hotel, San Francisco. Information: National Industrial Conference Board, 247 Park Ave., New York 17, N. Y. Secretary: Herbert Briggs.

Aug. 24-26, West Coast Electronic Manufacturers Association: Western electronic show and convention, Civic auditorium, San Francisco. Information: WESCON, 344 N. LaBrea Ave., Los Angeles 36, Calif.

Aug. 28-Sept. 1, National Association of Furniture Manufacturers: Furniture supply fair, Conrad Hilton hotel, Chicago. Association's address: 666 Lake Shore Dr., Chicago 11, Ill. Secretary: John M. Snow.

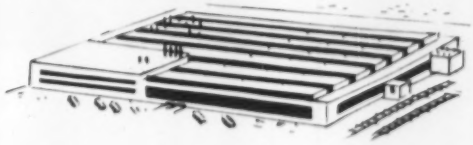
Aug. 31-Sept. 26, World's Fair of Power: S. Lake Shore Dr. adjacent to Soldiers Field, Chicago. Sponsor: General Motors Corp., General Motors Bldg., Detroit 2, Mich.

Sept. 5-6, American Machine Tool Distributors Association: Annual meeting and show, Blackstone hotel, Chicago. Association's address: 1900 Arch St., Philadelphia, Pa. Secretary: Thomas A. Fernley Jr.

At your service...

FOR THE PRODUCTION OF

complete machines, assemblies, sub-assemblies, machine parts



If you are faced with the problem of producing machines or parts for which your own equipment is not entirely adequate, you'll find Crown a reliable source for this kind of work. As one of the leading manufacturers of machinery for the soft drink, brewing and dairy industries, Crown has extensive machine shop facilities and a wealth of experience in producing precision parts and assemblies of the highest order. Let us show you how our plant and organization can serve you.

CROWN CORK & SEAL COMPANY, INC.

Baltimore 3, Md.

Send for this book describing our manufacturing facilities now.

CROWN

Crown Cork & Seal Company, Inc.
Advertising Department—Section 5
Box 1837 • Baltimore 3, Md.

Please send me a copy of the book describing your facilities for manufacturing General Industrial Equipment.

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Company .....

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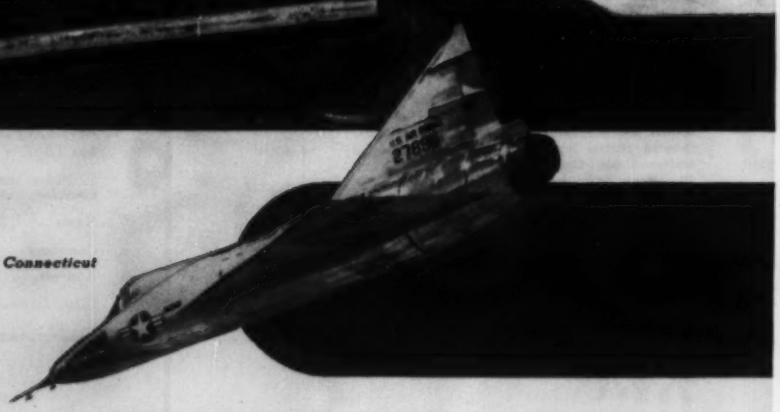
City ..... Zone ..... State .....

CINCINNATI Shears at

meet terrific



Materials being sheared in these illustrations are .093 Nimonic and .050" 5510 stainless steel.

Photos courtesy Pratt & Whitney Aircraft, East Hartford, Connecticut and Convair, San Diego, California.

PRATT & WHITNEY AIRCRAFT

demand for jet aircraft engines . . .

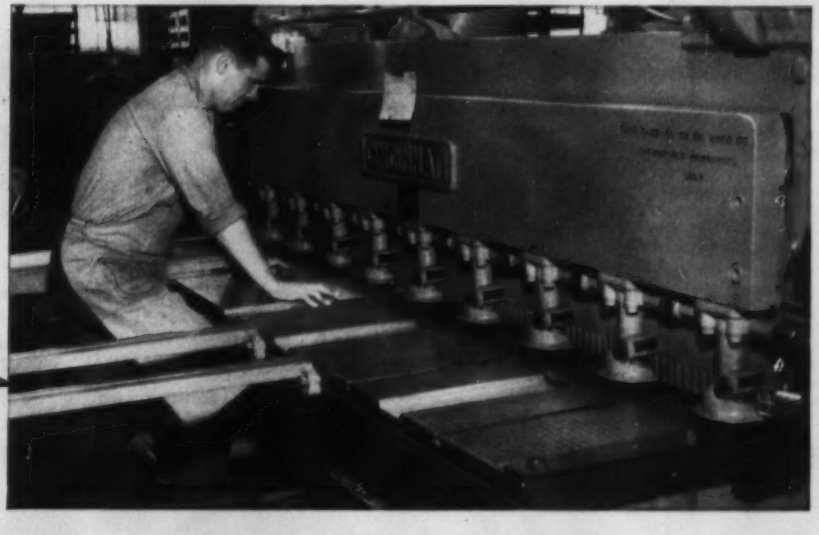
The right tools for the job were needed at Pratt & Whitney Aircraft, in their tremendous expansion, in the production of the highest power turbojets.

Cincinnati Shears are used in this program. Their accurate performance and ability to shear a wide variety of materials decided their selection.

Investigate:

- **Cincinnati "Single Clearance" shearing**
- **Cincinnati Hydraulic Holddowns**
- **Cincinnati All-Steel Interlocked Construction**

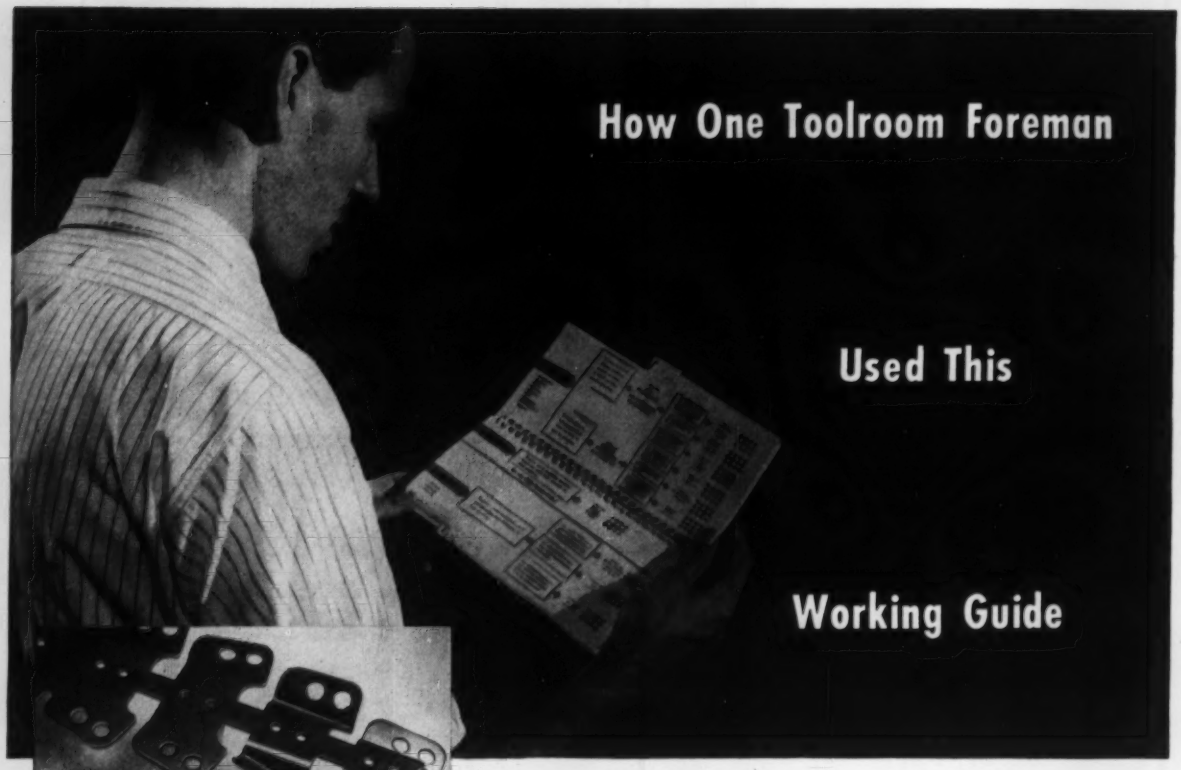
Write for complete Shear Catalogue S-6.



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI



Job: Punch that blanks stampings from SAE 1010 strip, .062" thick.

Problem: The punch is so unbalanced in design that safety in hardening is vital. Also, the punch is shear fitted to the die, and hardening accuracy is necessary to avoid expensive adjustments after heat treating. Other die steels were tried, but they either broke or changed size too much.

Solution: At this point the Toolroom Foreman called in Carpenter and started to become more familiar with the Matched Tool and Die Steel Manual. The Manual pointed to Carpenter *Vega* (Air-Tough) Die Steel for the punch. Now they're coming through right on the nose. Moreover, production between grinds has jumped from about 10,000 to 50,000 stampings. And the Foreman says that from here on, all his tools and dies will be made from Carpenter Matched Tool and Die Steels. (Write for a more detailed Field Report on this job.)

. . . To Increase Tooling Productivity

This is for the man responsible for tools and dies who looks at a diemaking job with these thoughts:

"How can I make it *easier?*"

"How can I avoid costly *heat treating hazards?*"

"What can I do to *improve the job?*"

If you're that man, Carpenter wants to help. We offer you plain, *practical* help based on almost 70 years' experience working with other men who feel like you do.

How does it pay off? Look at a typical example shown to the left! And your Carpenter representative can show you many more Field Reports of other interesting jobs.

Much of this help is packed into a 189-page working guide . . . Carpenter's "Matched Tool and Die Steel Manual". And that's only part of the program . . . a program backed by *dependable* die steels developed in Carpenter Research Laboratories with a long record of pioneering in new and improved steels.

We're ready to work with you, now. A call to your nearest Carpenter Mill-Branch Warehouse, Office or Distributor will tell us you are, too. THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

Carpenter STEEL — Matched Tool and Die Steels

IMMEDIATE DELIVERY from local warehouse stocks

Export Department: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Bremen Bearings, Inc., uses SUPERLA Soluble Oil to give bearings the clean, cool treatment

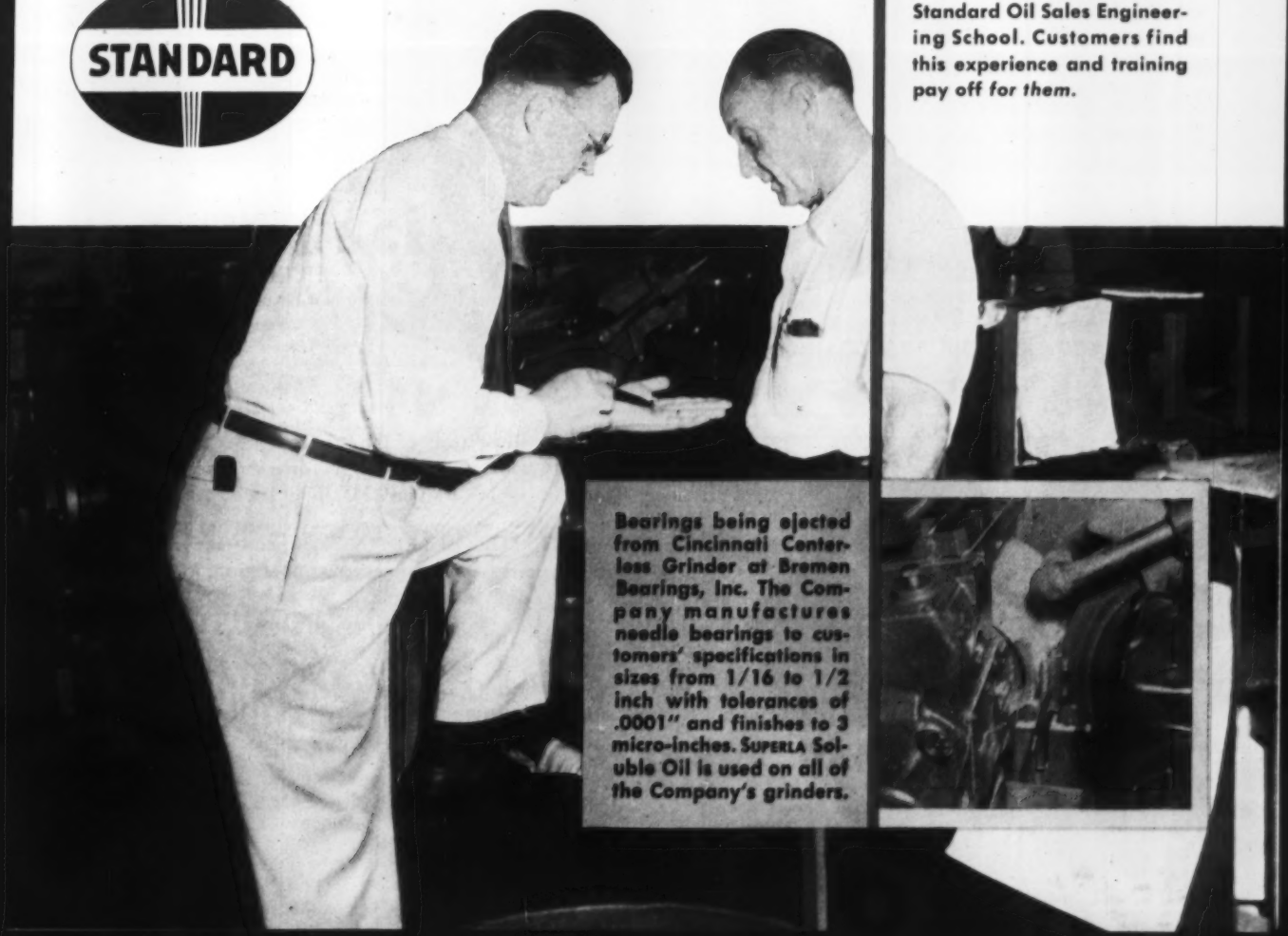
PRECISION NEEDLE BEARINGS are the exclusive product of Bremen Bearings, Inc., Bremen, Indiana. SUPERLA Soluble Oil is used exclusively in all eight of the Company's Cincinnati Centerless Grinders. Plant management experimented with various soluble oils before settling on SUPERLA. They found none could compare with SUPERLA Soluble Oil with respect to wheel loading, stability and tool machine cleanliness.

Plus these benefits, Bremen found SUPERLA mixed readily with water regardless of degree of hardness. The Company found, too, that they got longer tool life and maximum rust protection of work and machines.

You will have the same experience with SUPERLA Soluble Oil. Find out. Inquire of your Standard Oil lubrication specialist. In the Midwest call your nearby Standard Oil office. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Ill.

STANDARD OIL COMPANY (Indiana)

Franklin D. Clark (right), Sales Manager, Bremen Bearings, Inc., and Standard Oil lubrication specialist E. A. Hunt, inspect needle bearing. Gene Hunt is well qualified to assist industrial plants on lubrication problems. In addition to his three years' experience in industrial lubrication sales work, Gene has an M. E. degree from Purdue and has completed the Standard Oil Sales Engineering School. Customers find this experience and training pay off *for them*.



Bearings being ejected from Cincinnati Centerless Grinder at Bremen Bearings, Inc. The Company manufactures needle bearings to customers' specifications in sizes from 1/16 to 1/2 inch with tolerances of .0001" and finishes to 3 micro-inches. SUPERLA Soluble Oil is used on all of the Company's grinders.

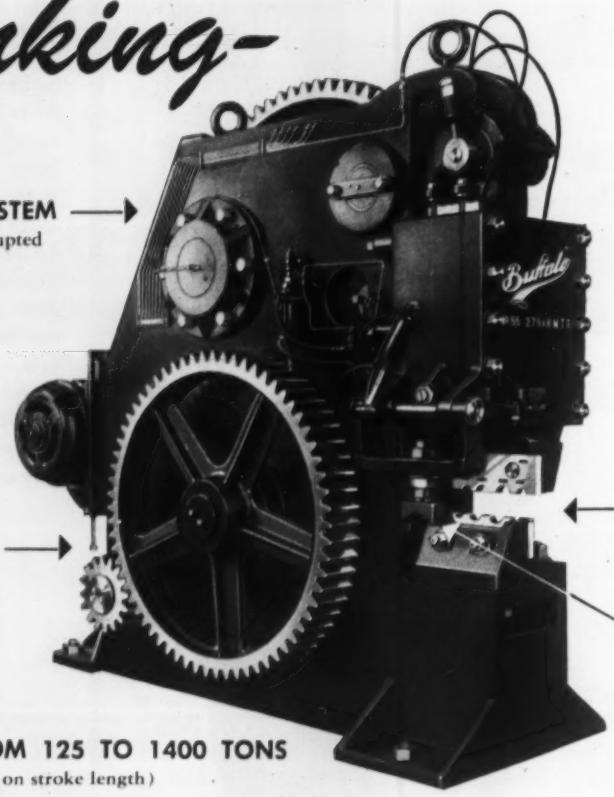
RIGHT FOR YOUR HEAVY-DUTY *Punching- Shearing- Blanking-*

"Buffalo"

MILL TYPE SHEAR

CENTRALIZED LUBRICATION SYSTEM provides long, uninterrupted service life.

HIGH TENSILE ELECTRICALLY WELDED STEEL PLATE FRAME MEANS GREATER STRENGTH WITH LESS MASS. Gears, bearings, plunger and all parts are of corresponding strength.



AMPLE TOOLING SPACE open on three sides, has adequate horizontal and vertical space to permit relatively heavy top and bottom bolsters.

AUTOMATIC AIR OPERATED TILTING STRIPPER

Shown is the "Buffalo" No. 55 Mill Type Shear with 6" stroke

IN CAPACITIES FROM 125 TO 1400 TONS
(depending on stroke length)

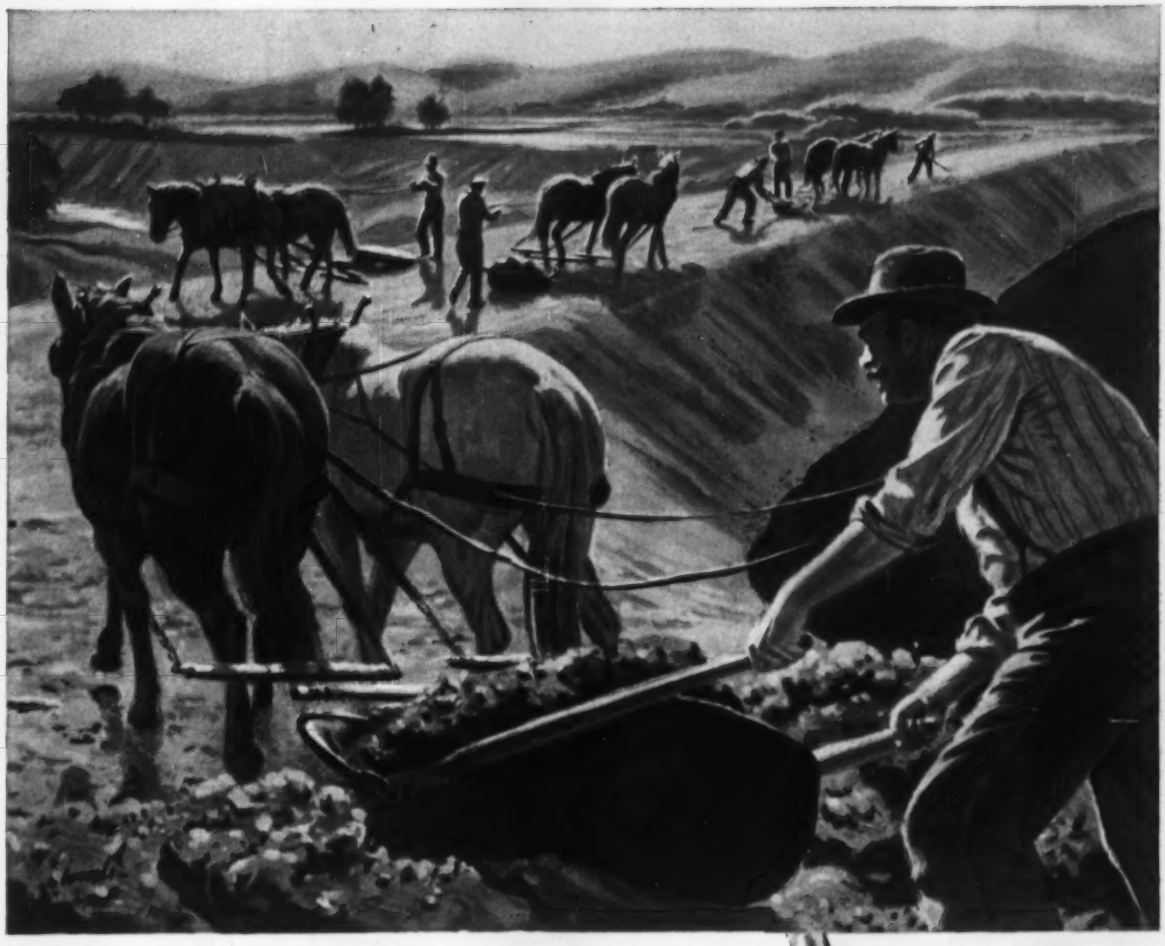
Shear No.	*Tons*	*Stroke*	*Tons*	*Stroke*
51	250	@ 2¼"	125	@ 4½"
52	300	@ 2½"	165	@ 4½"
53	370	@ 2¾"	200	@ 5"
54	420	@ 3"	210	@ 6"
55	500	@ 3¼"	200	@ 8"
56	550	@ 3½"	240	@ 8"
57	570	@ 4"	285	@ 8"
58	650	@ 4"	325	@ 8"
59	725	@ 4½"	400	@ 8"
60	875	@ 4½"	500	@ 8"
61	1050	@ 4½"	600	@ 8"
62	1400	@ 5"	875	@ 8"

Another illustration of the "Q" Factor—the built-in Quality which provides trouble-free satisfaction and long life—in "Buffalo" Machine Tools.

WRITE FOR BULLETIN 3650 and our recommendations on your particular operation.

BUFFALO FORGE COMPANY
158 MORTIMER STREET BUFFALO, N. Y.
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.



no match for MUSCLES OF STEEL

America's towering dams stand as mighty monuments to the efficiency of modern excavating and earth-moving equipment. On these machines, *muscles of steel*—rugged wire rope—handle with ease and dispatch the tasks that once were back-breaking for man and beast.

Wherever big construction projects are under way, you'll find Wickwire Rope at work—helping to do a better, faster and more efficient job.

Same way—in the mines and quarries ...in the oil fields and logging camps... with the fishing fleets and in materials handling. Here, too, Wickwire Rope has won outstanding preference because of its proved durability and demonstrated reliability and economy.

***every* industry benefits from wire rope**

WICKWIRE ROPE

CF&I PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New Orleans • New York • Philadelphia

2696

TRAMBEAM

speeds production at

WESTINGHOUSE

jet engine plant

Here's why jet engine production moves fast at the Westinghouse plant in Kansas City, Missouri! Used in *seven* departments, Trambeam Overhead Handling Systems simplify tool movement to and from machines and speed handling of parts-in-process between machines or to temporary storage. Output per man and per machine is high. Plant areas are *fully* utilized. The need for floor-borne handling equipment is reduced, and traffic bottlenecks are prevented. At Westinghouse, flexible Trambeam is always available when needed, where needed . . . easily push-button operated by one man. Look to Trambeam for your own handling needs!

An interesting and informative case study has been prepared on the Trambeam installation at Westinghouse. Send for your free copy today, and the name of your Trambeam distributor.

TRAMBEAM
Dollar-wise Features

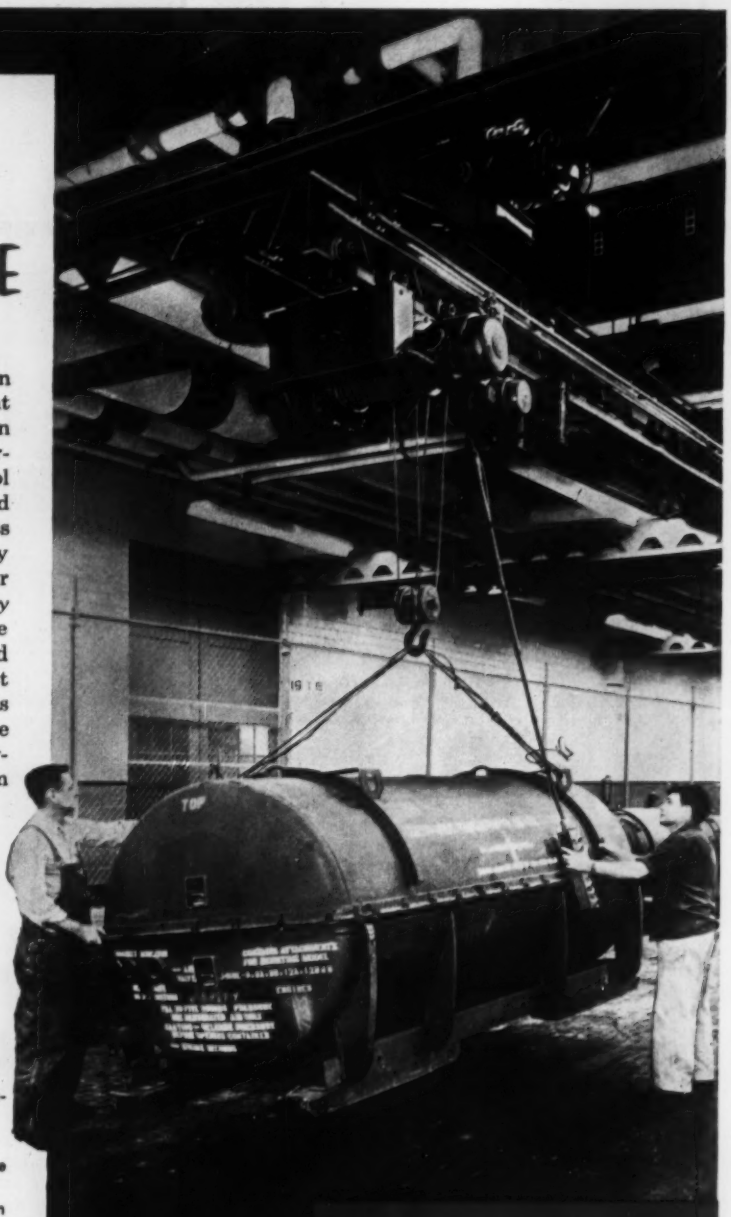
- Cranes for complete area coverage . . . monorail for point-to-point transport.
- High carbon rails assure long life operation.
- Flexible suspension minimizes bending fatigue and keeps load stress vertical.
- Friction-reducing carrier design has Timken double row, tapered roller bearings.
- Underhung carriers provide maximum headroom, greater speed and improved control.
- Capacities up to 15 tons with full motorization.

WHITING CORPORATION

15643 Lathrop Avenue, Harvey, Illinois

Other Whiting Products:

Trackmobile • Overhead Engineered Cranes • Electric Furnaces and other types of Foundry Equipment • Chemical Processing Equipment, such as Evaporators and Spray Dryers • Railroad Equipment and Metal-cutting Machinery



WHITING

TRAMBEAM

Here Trambeam is used to quickly move a packed jet engine to the shipping department . . . one of the seven Trambeam equipped departments at Westinghouse.

WELDMENTS of "T-1" Steel—made with AWS 12015 low hydrogen coated electrodes and without pre- or post-heating — develop the full 90,000 psi yield strength. As a result, lightweight designs are completely safe and reliable.

NEW USS "T-1" STEEL has great potential for reducing cost of pressure vessels

You've heard of Operation "T-1." You've heard how those dramatic tests proved that, when and if higher design stresses are permitted, USS "T-1" constructional alloy plate steel will make possible larger, stronger pressure vessels, vessels that can be built more easily and at lower over-all cost. As a result of Operation "T-1," several major pressure vessel fabricators have requested approval from the ASME to use USS "T-1" Steel in unfired pressure vessels. Why? For mighty good reasons:

"T-1" Steel has a very high yield strength – 90,000 psi minimum – three times that of conventional plate steels now used in pressure vessels. Yet it is extremely *tough* and can withstand high stresses and pressures even at temperatures far below zero. What's more, USS "T-1" Steel remains strong at *high* temperatures up as high as 900 degrees F.

Yet, "T-1" Steel is easy to fabricate. It can be drilled, machined, or cold formed, and welded or flame-cut *without* pre- or post-heating. **"T-1" can make pressure vessels . . .**

LARGER. For a given pressure and shell thickness, the *radius* of a vessel may be increased in direct proportion to the ratio of working stresses. Result: more storage capacity at lower cost.

STRONGER. For a given radius and shell thickness, the *pressure* may be increased in proportion to the ratio of working stresses. Result: vessels for higher pressures at lower cost.

LIGHTER, EASIER TO BUILD. For a given pressure and radius, the shell thicknesses may be reduced, thus permitting larger vessels to be fabricated *without stress relief*. Result: lower fabrication cost.

United States Steel, Room 4667
525 William Penn Place, Pittsburgh 30, Pa.

☐ Please send me your booklet "United States Steel presents T-1" which contains the full story of "T-1" steel.

☐ Have your representative get in touch with me.

Name .....

Address .....

City ..... State .....

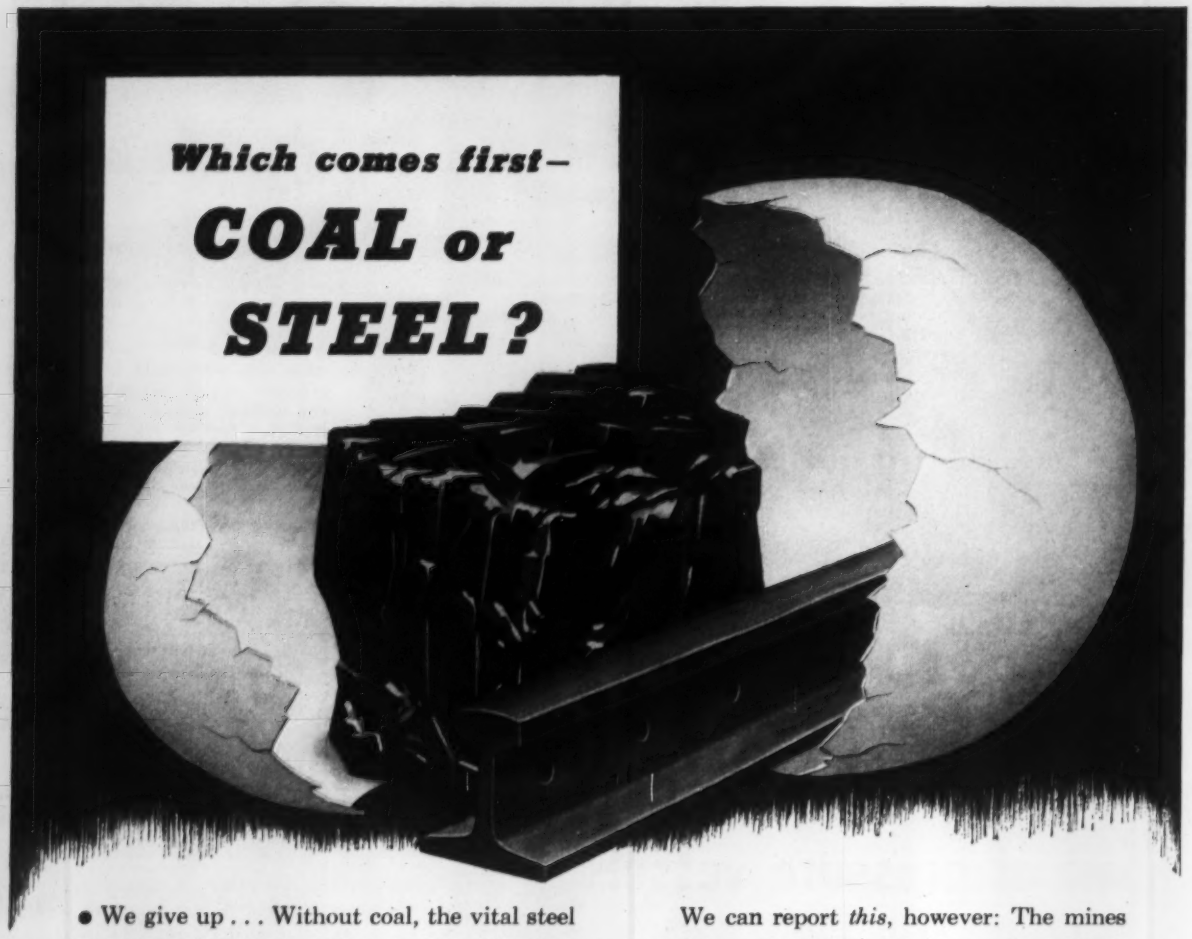
UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS "T-1" CONSTRUCTIONAL ALLOY STEEL

SEE THE UNITED STATES STEEL HOUR. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

USS

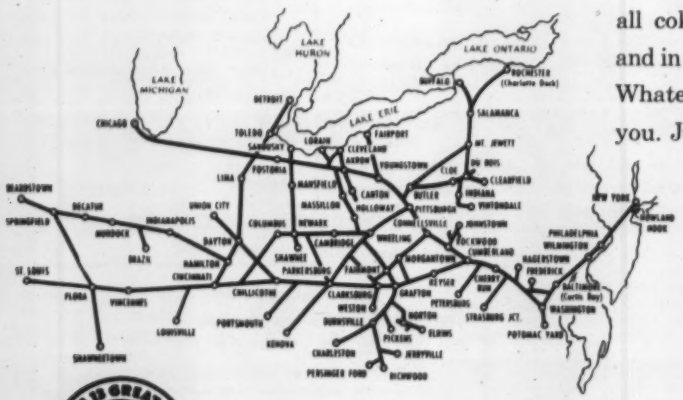
UNITED STATES STEEL



• We give up . . . Without coal, the vital steel industry of today could not exist. Without steel, the enormous tonnage of coal needed by the steel industry could not be produced or delivered. Here is another example of the interdependence of two basic industries!

We can report *this*, however: The mines in Baltimore & Ohio territory are prepared and equipped to go right along with the steel industry in its expansion program. Too, there are millions of tons of untapped reserves of coking coals available for development.

These coals are available in varieties for all coking needs. They are easily accessible, and in plentiful supply for long-range planning. Whatever your requirements, let us advise you. Just *ask our man!*



BITUMINOUS COALS FOR EVERY PURPOSE

LINKING 13 GREAT STATES WITH THE NATION
B&O

BALTIMORE & OHIO RAILROAD

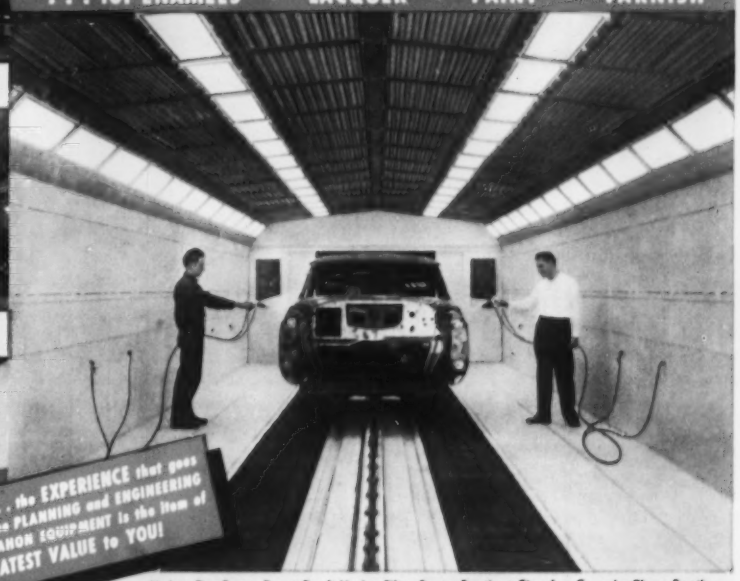
Constantly *doing things*—better!

COMPLETE *Finishing* SYSTEMS

. . . for ENAMELS • LACQUER • PAINT • VARNISH

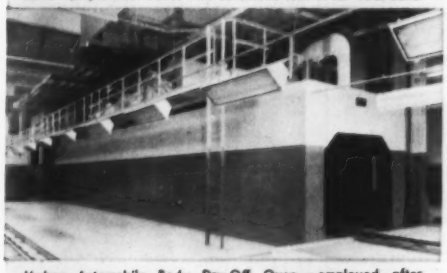
Mahon Pressurized Tack-Off Enclosure. These are installed at the entrance end of Mahon Sealer Coat and Finish Coat Spray Booths.

Sealer Coat Tack-Off Enclosure and Spray Booth. Similar Final Color Coat Equipment at Right, with Wet Sand Deck between.



Mahon Dry Sump, Down-Draft Hydro-Filter Spray Booth at Chrysler, Canada. These Booths are equipped with Paint Strippers for continuous cleaning of traveling grating in floor exhaust vents.

Mahon Automobile Body Finish Baking Ovens. These Ovens have multiple heat zones with automatic control for each zone.



Mahon Automobile Body Dry-Off Oven — employed after Cleaning and Rust Proofing and after Wet Sanding operations.

Mahon Cooling Tunnel. These Cooling Tunnels reduce time-length requirements—permit more compact arrangement of equipment.

CANADIAN CHRYSLER BODIES are FINISHED in NEW, MODERN MAHON FINISHING SYSTEM!

Chrysler Corporation of Canada, Ltd., can today point to one of the world's most modern and most efficient automobile body finishing systems. In planning this installation, no detail was overlooked by Chrysler and Mahon engineers that would in any way add to operating efficiency or minimize maintenance and operating costs . . . many new features which make for long-range economy and contribute to better working conditions make their appearance for the first time in equipment of this type. If you have a finishing problem, or are considering new finishing equipment, you, like thousands of other manufacturers, will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements . . . and better qualified to do the all-important planning and engineering of equipment—which is the key to fine finishes at minimum cost. You will find also, that Mahon equipment is built better for more economical operation over a longer period of time—a factor to be weighed carefully when comparing initial cost figures. Mahon will do your complete job on one contract . . . undivided responsibility for the entire system insures proper coordination and safeguards you against complications which may upset your production plans or subsequent schedules. See Mahon's Insert in Sweet's Plant Engineering File for information, or write for Catalog A-655.

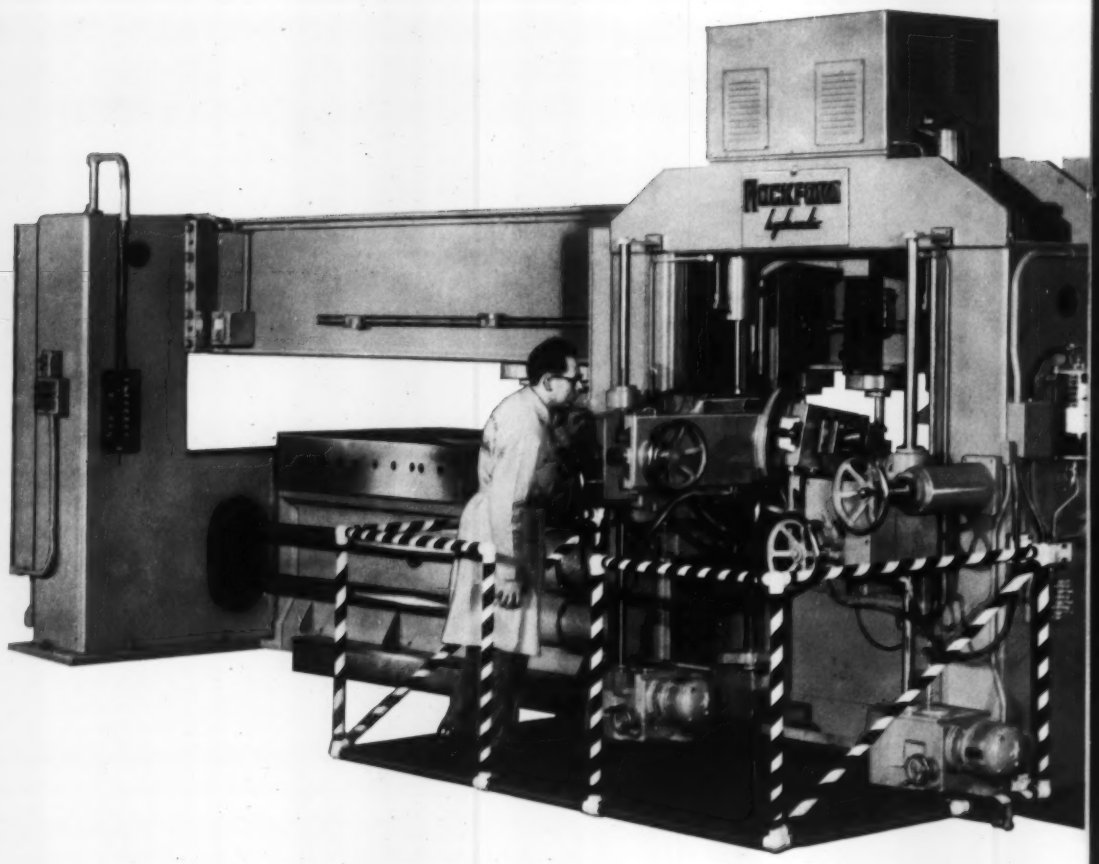
THE R. C. MAHON COMPANY

HOME OFFICE and PLANT, Detroit 34, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.

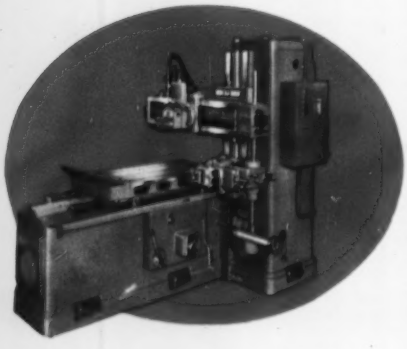
Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling, and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems and Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

MAHON

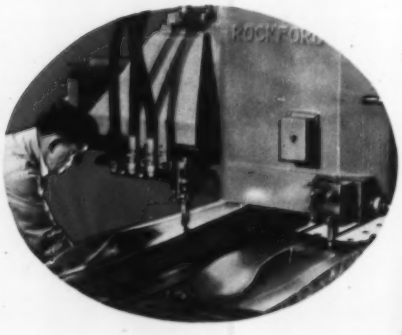
another new hydraulic design . . .



Hydraulic Openside Shaper



Hydraulic Kopy-Kat Duplicator



Hydraulic Shaper-Planer

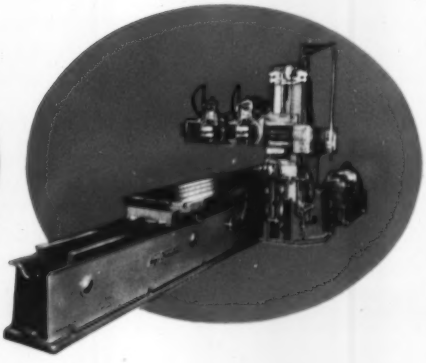
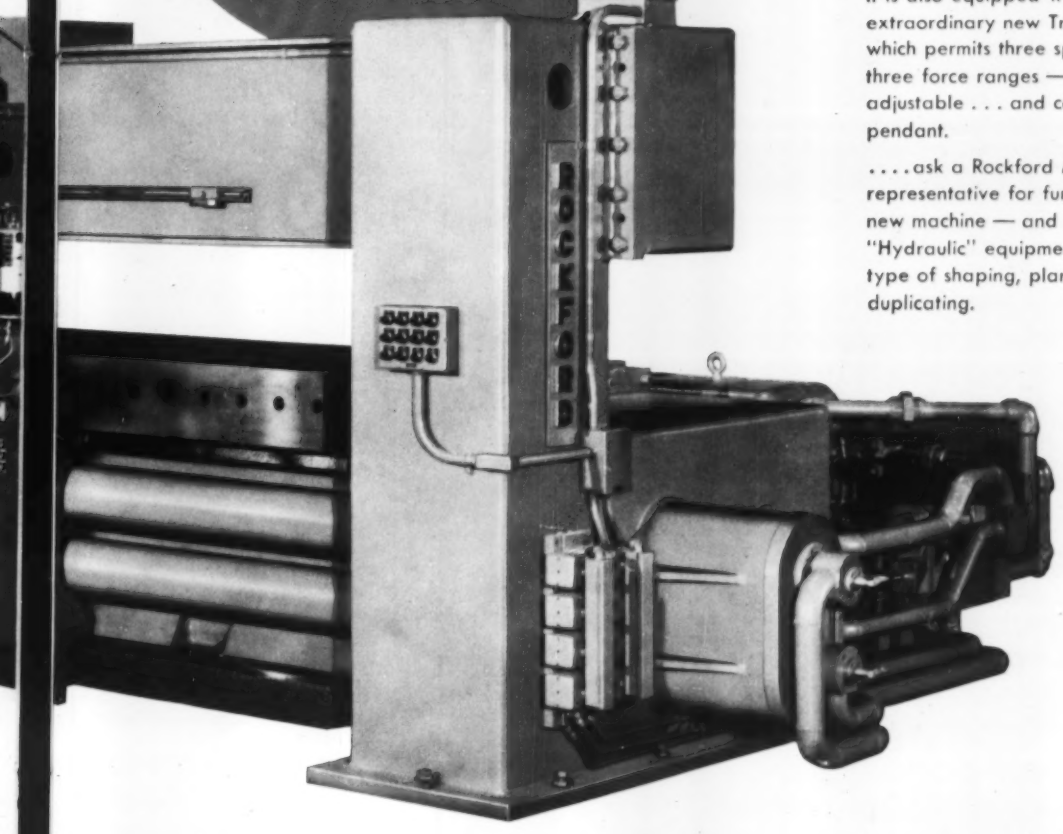


plate edge PLANER

with triple circuit!



....the new Plate Edge Planer is one of the latest developments of the Rockford Machine Tool Co.

....it represents the first basic improvement in this type of machine in the past half century.

....the Hydraulic Plate Edge Planer has a working capacity up to 30' wide x 7 inches thick and its saddle reciprocates from 10 to 200 feet per minute. It is also equipped with the company's extraordinary new Triple Circuit . . . which permits three speed ranges and three force ranges — all infinitely adjustable . . . and controlled from the pendant.

....ask a Rockford Machine Tool Co. representative for further details on this new machine — and how modern "Hydraulic" equipment cuts costs on every type of shaping, planing, slotting and duplicating.

ROCKFORD MACHINE TOOL CO.
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Hy-Draulic

THE *NEW* 100 SERIES

BOSTON Gear.

again sets the standard for cost-wise speed conversion

The New 100 SERIES Reductors and Ratiomotors are designed for peak efficiency and new economy by industry's largest, most experienced manufacturer of standard STOCK speed reduction units . . . BOSTON Gear.

You can select 100 SERIES Reductors and Ratiomotors with complete confidence that they set new performance standards, reduce costs, save space and weight, and simplify your job of product design.

Certified Ratings

Listed output of 100 SERIES units is certified by BOSTON Gear to be actual torque delivered, as determined in *Independent Laboratory* tests. Design around the 100 SERIES. Give *your* product the *extra value* of speed reduction units that deliver

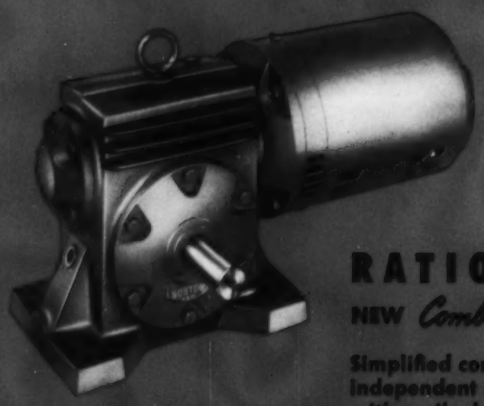
Certified

MAXIMUM HORSEPOWER PER DOLLAR
by actual test!

REDUCTORS

NEW space-saving design
NEW clean contours
NEW gearing efficiency
NEW cooling fins
NEW maintenance savings
BOSTON GEAR quality

FAN-COOLING
Optional on larger sizes



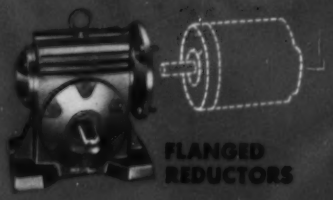
RATIOMOTORS

NEW *Combination* DESIGN

Simplified construction combines independent reduction gear unit with easily detachable, standard end-mounted motor for easy maintenance. Permits . . .

1 Replacement of motor without disturbing reduction gear unit.

2 Replacement of original motor at any time with motor of special characteristics (totally enclosed, explosion-proof, etc.).



FLANGED REDUCTORS

are the reduction gear units of Ratiomotors supplied to you without motor. You buy and attach any end-mounted motor you choose. Flanged Reductors are made in the same range of models and ratings as Ratiomotors.

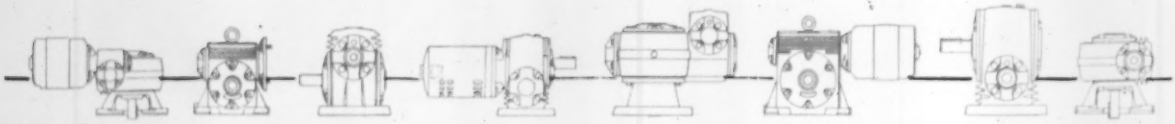
53BG-R-12

CALL YOUR **BOSTON Gear** DISTRIBUTOR

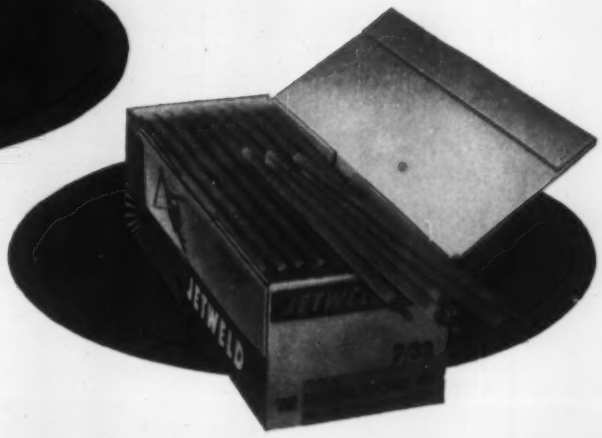
GET NEW CATALOG R-56

Gives complete information, selection charts, engineering data. Ask your BOSTON Gear Distributor, or write: Boston Gear Works, 73 Hayward St., Quincy 71, Mass.

108 MODELS — 1064 DIFFERENT UNITS — FROM STOCK — FOR ANY DRIVE



Welding industry's greatest cost-cutting twins . . .



IDEALARC and JETWELD

Never before has any combination of welder and electrode offered such a cost-saving potential in faster, easier welding. Here's why:

Idealarc for easy, efficient operation . . . first welder to give you *both*
AC AND DC WELDING CURRENT
with Dual Arc Control where you select "soft arc" or "forceful arc" on AC as well as DC
and in addition . . . hot starting on DC as well as AC

Jetweld for high-speed operation . . . first universally adopted iron-powder electrode for
extra-fast welding
high deposition
drag operation

LET LINCOLN DEMONSTRATE HOW YOU CAN PROFIT . . . NOW. Send for Bulletin 1343. Write . . .

THE LINCOLN ELECTRIC COMPANY
Dept. 1606 • Cleveland 17, Ohio
The World's Largest Manufacturer of Arc Welding Equipment

(Advertisement)

How the Steel Industry Is Fighting Air Pollution

When the public hears about dust and fume control it is often in terms of what has *not* been done. It is important that they should also know what *has* been done, because the record of the steel industry is one of the most progressive.

The purpose of this discussion is to give the executives the facts to prove this point.

Q. *First of all, how can you measure the progress of dust and fume control in the iron and steel industry?*

A. As you know, there are many ways to combat air pollution. Equipment and methods vary in effectiveness, but the industry agrees that electrical precipitators have the highest collection efficiencies. By keeping track of the demand for this high efficiency equipment over the years, we can get a good indication of the importance the industry places on dust and fume control and the progress they are making.

Q. *Do these figures show an increasing interest in this high efficiency equipment?*

A. Suppose we let the figures speak for themselves. Since 1945 precipitator capacity in the steel industry had a greater increase than in any previous ten year period. Precipitators handling about 6½ million cfm were installed during this period.

Q. *But can't you attribute this growth to the increase in steel-making capacity?*

A. Some of this growth is due to expanded production facilities, but that's just a part of it. For instance, iron and steel production has increased about 30% since 1945 — but precipitator capacity has increased about 130% during this same period.

Q. *In the old days, I guess precipitators were used primarily in blast furnaces, weren't they?*

A. That's right. The first one went into operation in 1930. Since then, 169 Research Cottrells have been ordered by the industry.

Q. *What about new applications?*

A. We have a number of new uses that have proven themselves on the job. Open hearths, for instance. In one installation, our precipitators reduced stack discharge to a little over 2 pounds per hour. That's quite a reduction when you consider that the discharge without a precipitator ranged from 75 to 245 pounds per hour.

Q. *I understand your Cottrells are used on some sintering machines now. Is this true?*

A. Yes, we have three in operation and more under construction.

Q. *How about scarfing machines?*

A. This is a recent application which has worked out very satisfactorily. Two precipitators are now in operation on this application.

Q. *Has anything been done on such problems as iron cupolas, electric furnaces, and ferromanganese blast furnaces?*

A. Yes. Installations have been made on all these problems.

Q. *How do you go about developing these new applications?*

A. We work very closely with our customers on these new projects. Our laboratory is a big help, and our 40 years of pilot plant experience plus over 2,000 precipitators give us the kind of experience that leads to the successful engineering of projects like these.

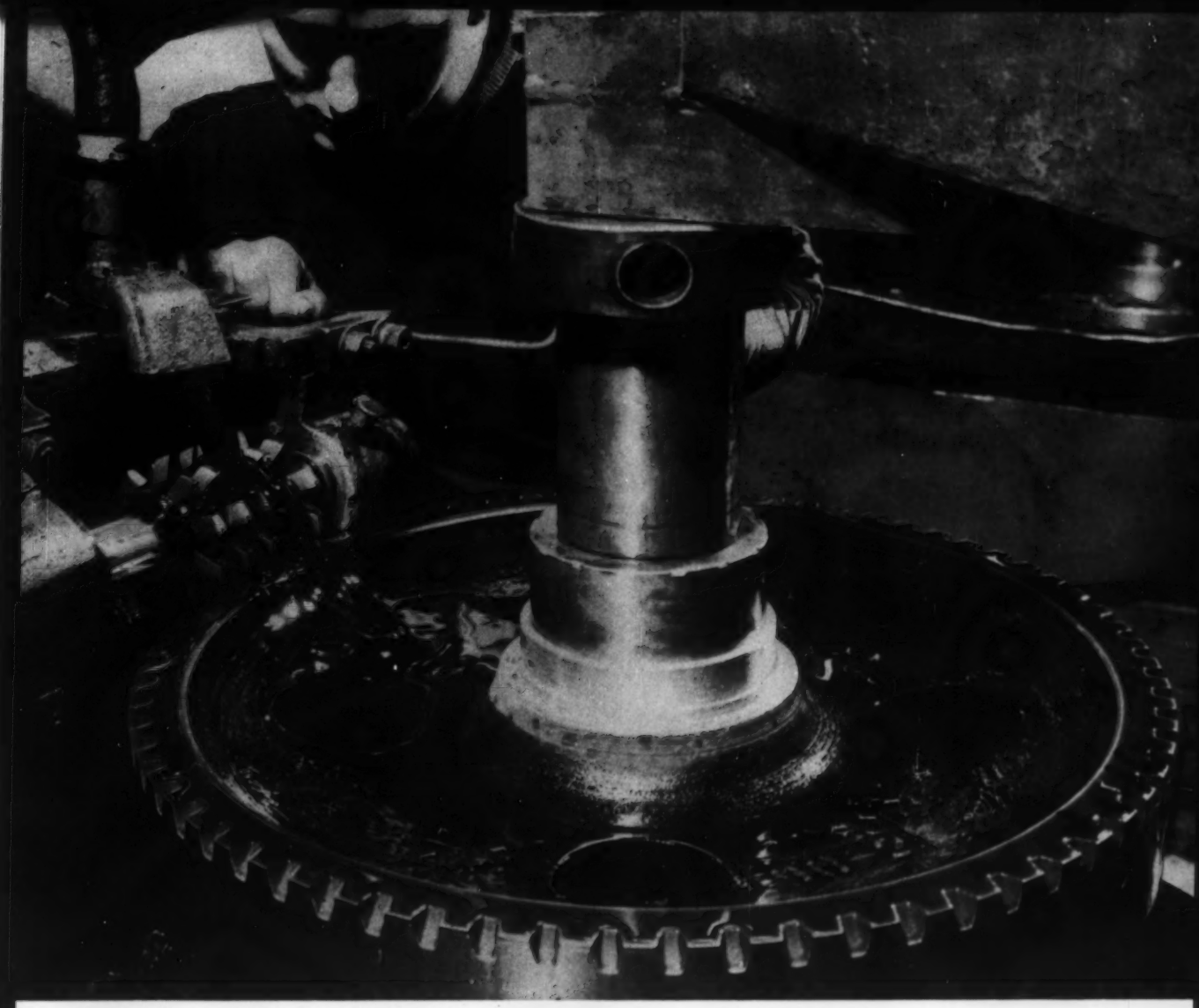
If you would like to have more information about these applications, or if you want to investigate the possibility of using precipitators on other equipment, our nearest representative will be glad to call on you.

RESEARCH-COTTRELL, INC.

A Wholly Owned Subsidiary of Research Corporation

MAIN OFFICE AND PLANT: BOUND BROOK, N. J.

405 Lexington Ave., New York 17, N. Y. Grant Building, Pittsburgh 19, Pa. • 228 N. La Salle St., Chicago 1, Ill. • 111 Sutter Bldg., San Francisco 4, Cal. RC150



Pittsburgh Gear switched to SSW forged blanks... saved 50 minutes machining time, extended cutter life 20%

Switching to SSW forged steel gear blanks in manufacturing mine locomotive drive gears has given Pittsburgh Gear Company, Neville Island, Pa. . . .

- **savings of 50 minutes in machining time.**
- **better performance through extended service life (cutter life increased 20%).**
- **reduced cutter costs.**
- **over-all lower initial cost.**

These benefits are a result of the more uniform internal structure and close dimensional tolerances of Standard Steel blanks. Machining is done on a single setup, at a maximum speed because there's no danger of hard spots and sand porosity as with castings.

Pittsburgh Gear knows their product must take extra-rugged wear in mining operation. In service the continuous starting and stopping of mine locomotives subjects drive gears to severe shock and impact. The denser core and uniform structure of these SSW blanks contribute to longer-lasting, failure-proof life of these gears.

Like Pittsburgh Gear, you can improve your product and cut your costs with SSW forgings. Write today for the new Standard Steel folder on forged weldless rings and flanges. Use the coupon now.

Standard Steel Works Division

BALDWIN-LIMA-HAMILTON

Dept. 8546, Standard Steel Works Division
Baldwin-Lima-Hamilton Corporation, Burnham, Pa.

Please send me new Standard Steel Works folder containing detailed information on Forged Weldless Rings & Flanges.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

16 surfaces

...on this Garrison Gear Chuck

THE BODY
(soft semi-steel)

THE CONTROL RING
(soft tool steel)

AND THE 6 JAWS
(hard tool steel)

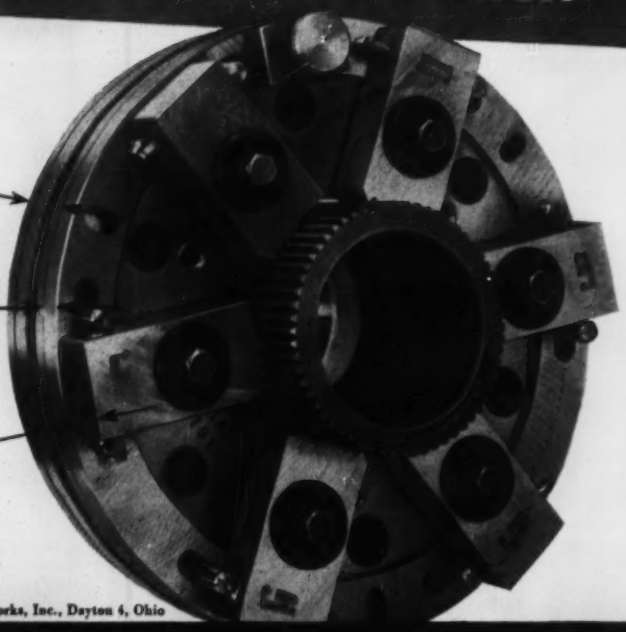


Photo courtesy of Garrison Machine Works, Inc., Dayton 4, Ohio

are Blanchard ground for precision

As every machinist knows, machine tools impart their precision through their chucks. That's why chuck dimensions and tolerances are of critical importance . . . and why Blanchard Surface Grinders are commonly used to produce the flat surfaces required.

Blanchard Surface Grinders are ideal for all kinds of precision grinding jobs. They produce extremely close tolerances for flatness, size and parallelism . . . *at low costs and high production rates.* Many Blanchard users grind surfaces flat to within 2 to 4 light bands, parallel to less than .0001", with dimension tolerance of .0002", and surface finish to better than 3 micro inches.

Whether your work involves precision machining or rapid removal of stock, take the advice of master machinists . . .

PUT IT ON THE BLANCHARD

No. 11 Blanchard Surface Grinder

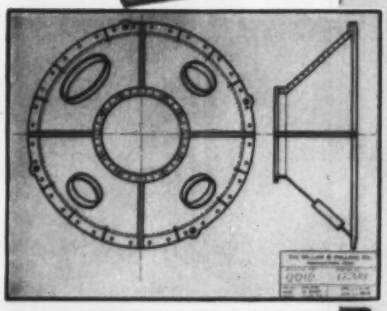
Send for your free copies of "Work Done on the Blanchard", fourth edition, and "The Art of Blanchard Surface Grinding".

PUT IT ON THE BLANCHARD

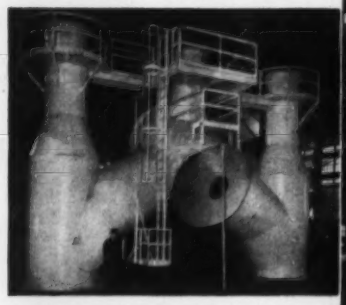
THE BLANCHARD MACHINE COMPANY

64 STATE ST., CAMBRIDGE 39, MASS., U.S.A.

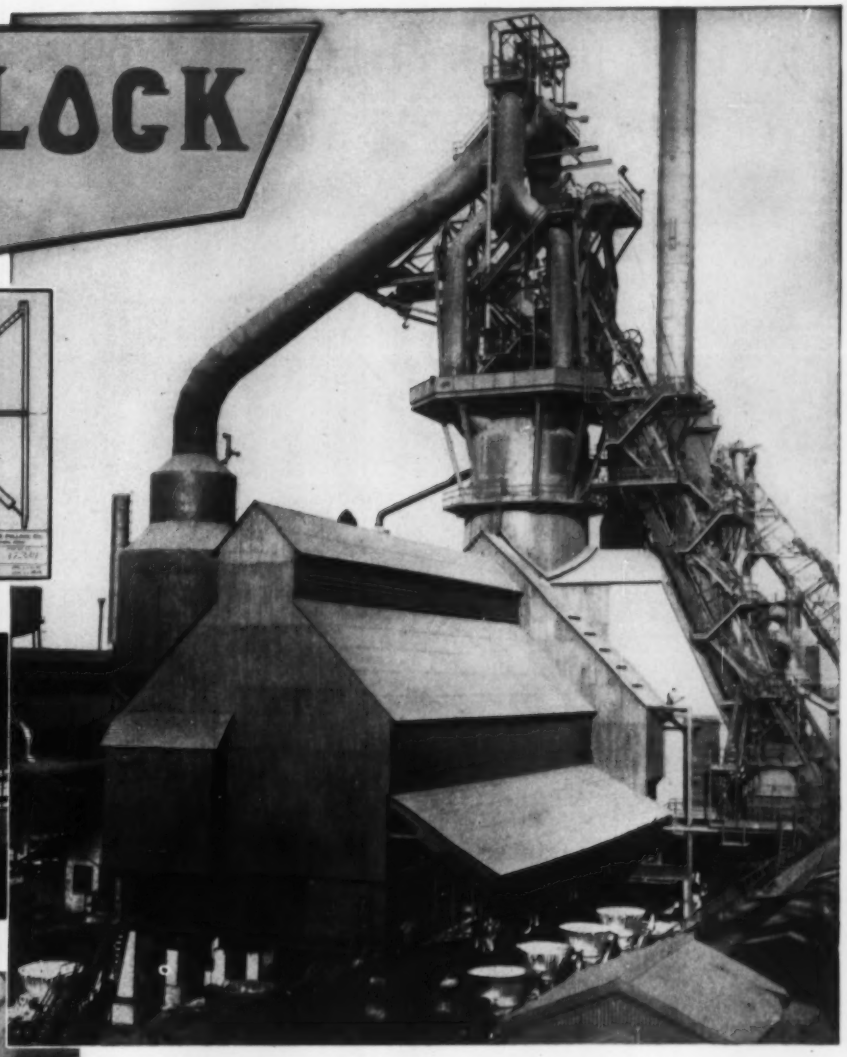
POLLOCK



ENGINEERING



SHOP FABRICATION



FIELD ERECTION

Correlating the skills of Pollock engineering, fabrication and field erection to specific operational requirements of The Youngstown Sheet & Tube Company are evidenced in this blast furnace. In addition to furnishing the steel work for this blast furnace, Pollock designed and built auxiliary equipment, including the hot metal ladle cars and cinder cars shown in the above picture. The experience which the Pollock Company has gathered in over eighty-five years is available to you in planning your new projects.

Blast furnace STEEL WORK

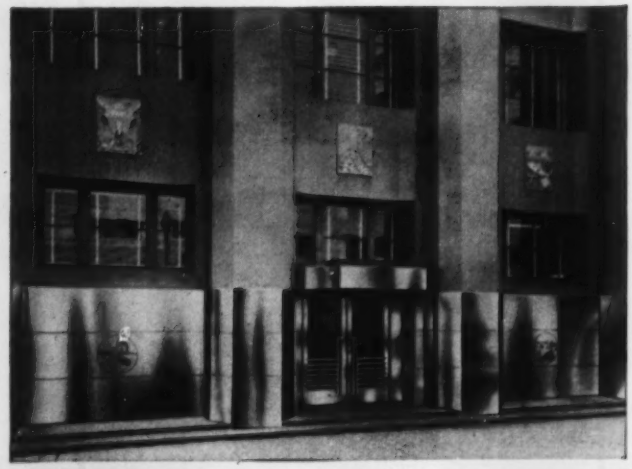
POLLOCK

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN · OHIO
STEEL PLATE CONSTRUCTION · ENGINEERS · FABRICATORS · ERECTORS

BLAST FURNACES · HOT METAL CARS AND LADLES · CINDER AND SLAG CARS · INGOT MOULD CARS · CHARGING BOX CARS · WELDED OPEN HEARTH LADLES

Wherever people give a building a beating

outside



or

inside

That's the place to use STAINLESS STEEL

"INFO" for Architects and Builders

1 "AL Structural Stainless Steels"—12 pages on stainless grades, properties, forms, finishes, standard "specs," uses and advantages.

2 "Stainless Steels for Store Fronts and Building Entrances"—40 pages of valuable data on examples and details. A1A File No. 26D.

3 "Stainless Steel Curtain Walls"—A 24-page progress report on methods. A1A File No. 15-H-1.

Write for Details

Address Dept. S-661

You *have* to design for maximum attractiveness in those areas of buildings which have most traffic—such as building fronts, marquees, entrances, lobby details, railings, etc. Yet those same places are exactly the locations where you need maximum utility, too.

What's the *best* material to use? Just remember that stainless steel—and *only* stainless steel—gives you the nearest-to-perfect combination of satiny beauty and rugged toughness. No other material is as good-looking and at the same time as strong, hard-surfaced and resistant to rust or discoloration. No other material requires as little maintenance, cleans as easily and lasts as long.

In short, whether you're considering Allegheny Metal for just the "hard-wear" spots or for an entire curtain-wall design, keep this fact in mind: *no other material costs as little over the long pull as stainless steel.*

Let us give you any information or technical assistance you may require.

Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.

Make it BETTER-and LONGER LASTING with Allegheny Metal

AL TIME-TESTED STAINLESS STEEL

WSD 5209

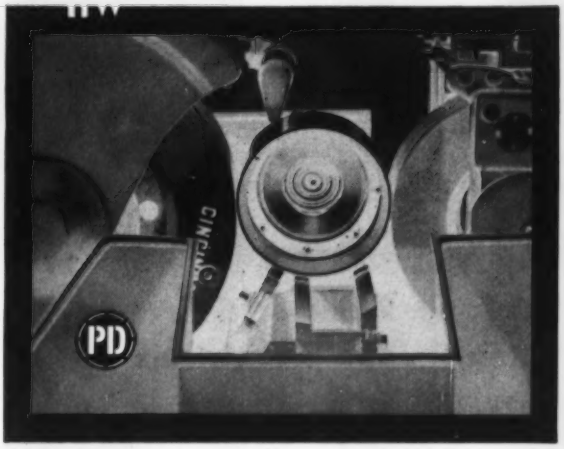
Warehouse stocks carried by all Ryerson steel plants

NOW!

Cincinnati Grinding Wheels offer

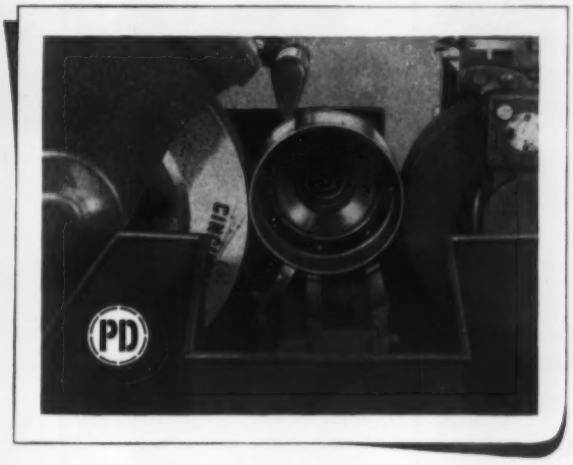
PD Positive Duplication

an outstanding development that will save you money and increase production



...POSITIVE DUPLICATION of an original grinding wheel each and every time through the CINCINNATI (PD) Manufacturing Process.

Just as a NEGATIVE guarantees you an exact duplication of a photograph each and every time, you are always assured a...



Positive Duplication is the best news in years for everyone who uses grinding wheels. And small wonder that (PD) is such big news! For here is a truly remarkable achievement in precision manufacturing and quality control that *absolutely can save you money . . . and increase your production.*

Through the CINCINNATI (PD) Manufacturing Process you are assured a Positive Duplication of the original wheel *every* time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

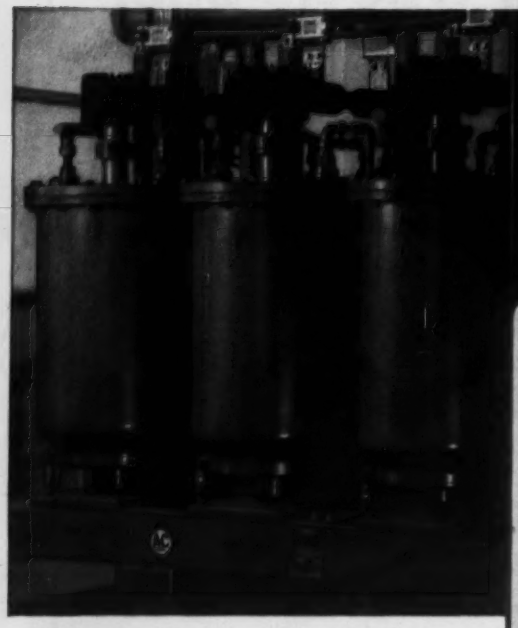
Yet CINCINNATI (PD) WHEELS *are priced no higher than ordinary wheels.*

We'll be glad to prove to you how CINCINNATI (PD) WHEELS can save you money and increase your production. Just contact us and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

CINCINNATI *Grinding Wheels*

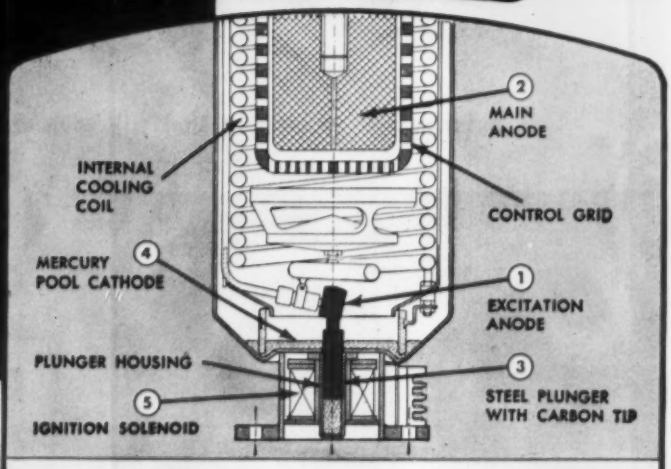
A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

Here's the Rectifier That Needs No Delicate Adjustments



This 1000-kw, 6-tube excitron rectifier is typical of units used for heavy-duty service in many industrial plants.

Mercury Arc Rectifiers



Unique Plunger Starts Continuous Excitation

The excitron tube has an excitation anode ① in addition to the main anode ②. With the excitation circuit de-energized, the steel plunger ③ floating in the mercury pool cathode ④ makes positive contact with the excitation anode (as shown).

When the excitation circuit is energized, the ignition solenoid ⑤ pulls the steel plunger ③ away from the excitation anode ① and under the mercury pool cathode ④, thus drawing a dc arc and forming the cathode spot, which makes conduction of load current by the tube possible.

If power is interrupted the plunger will float up, contact the excitation anode and automatically re-establish the excitation arc when power is restored.

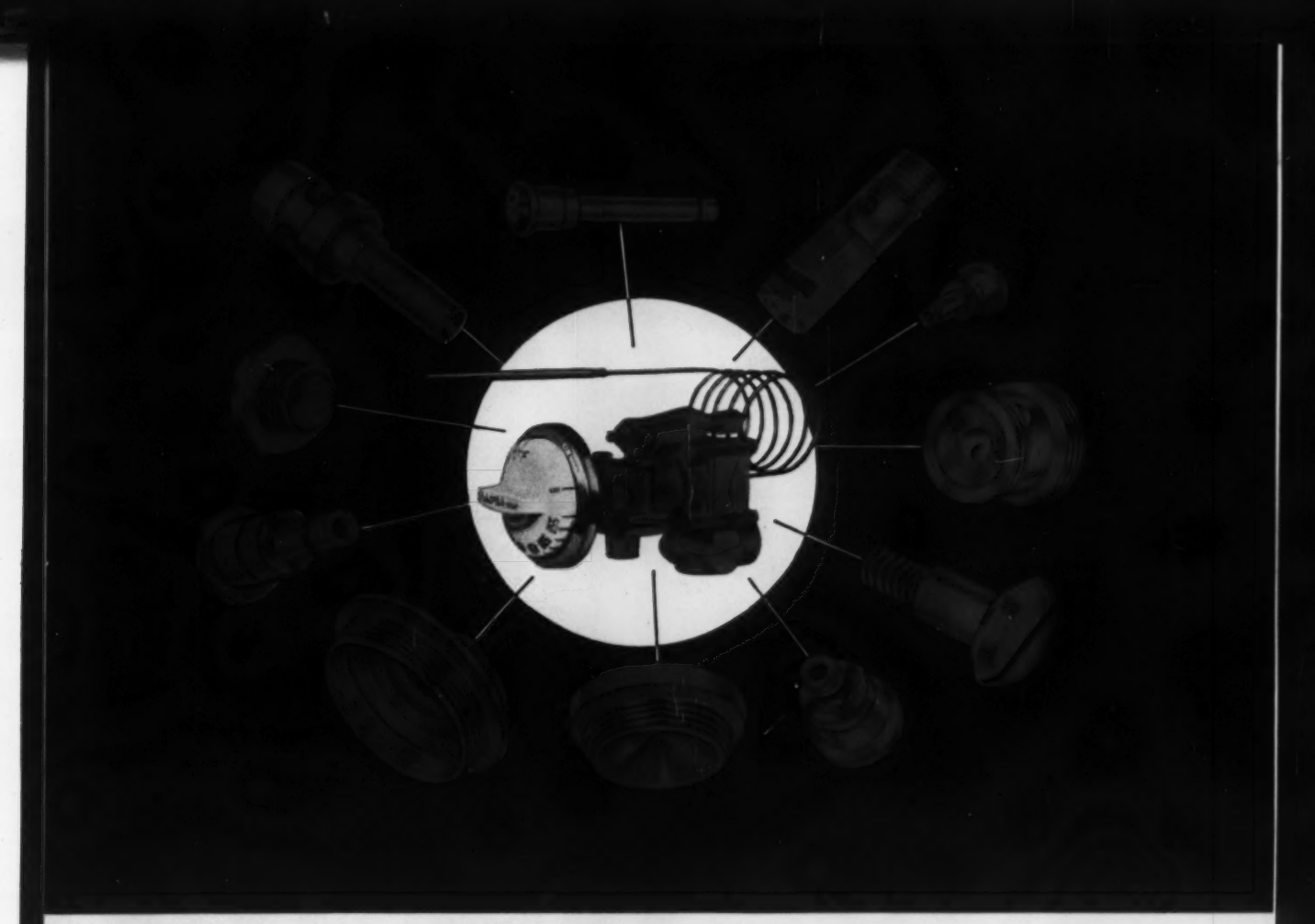
LITTLE MAINTENANCE IS NEEDED with Allis-Chalmers excitron-type rectifiers. Excitation of the excitron rectifier is continuous, while other types of rectifiers require re-ignition 60 times a second.

Since it is more difficult to start a rectifier arc than to maintain it, the excitron rectifier is much less likely to lose excitation during operation. Momentary dips in supply voltage which are encountered in many supply systems have no effect on the continuous excitation arc.

Years of operation in hundreds of installations have proved the reliability and ease of operation of Allis-Chalmers mercury arc rectifiers. You can get complete information from your nearby A-C office. Or write Allis-Chalmers, Milwaukee 1, Wis.

A-4581

ALLIS-CHALMERS



All these parts of the famous Robertshaw-Fulton thermostats are

MACHINED FROM REYNOLDS ALUMINUM

for not one, but seven sound reasons!

1. **Free-cutting Reynolds Aluminum screw machine stock possesses a definitely superior machineability over other metals.**
2. **By switching to aluminum for screw machine parts and cast bodies, Robertshaw-Fulton cut shipping weight approximately 1 lb. per item.**
3. **Aluminum holds lubricating grease at temperatures of 250°–350° F, where the previous metal did not.**
4. **Aluminum parts are singularly free from corrosive attack by the hydrogen sulphide found in the "sour" heating gases of many areas.**
5. **Aluminum parts do not cause certain fuel gases to break down and deposit carbon, as other metals do.**
6. **Aluminum can be color-anodized, permitting a color-coding system that eliminated a costly number-stamping operation on several parts.**
7. **Exterior aluminum parts, too, are now color-anodized for appearance, eliminating a polishing and plating process once needed.**

How about your screw machine products?

Consider the many advantages of Reynolds aluminum screw machine stock for your products.

Job for job, aluminum alloys machine at greater speeds and feeds. And unit costs for material, handling, and shipping step down because aluminum gives you *three times the number of pieces per pound!*

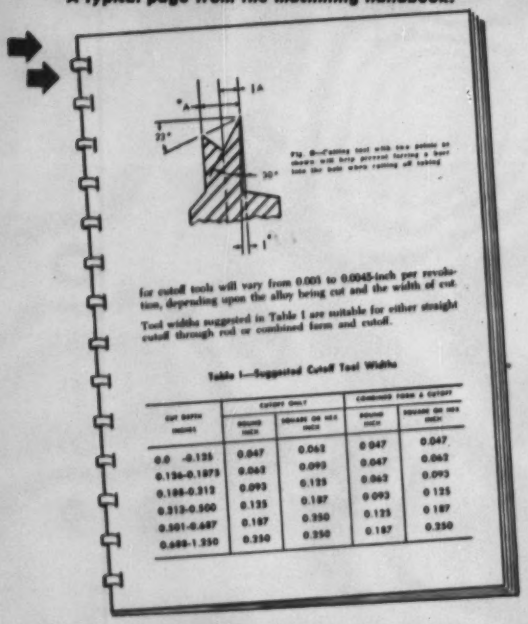
For assistance on any phase of the use of aluminum in your plant, call your nearby Reynolds office or distributor listed under "Aluminum" in your classified phone book. Write on business letterhead for your free copy of the 124-page handbook, "Machining Aluminum Alloys," and an index of other Reynolds literature. *Reynolds Metals Company, P. O. Box 1800-JL, Louisville 1, Kentucky.*

See "Mister Peepers", starring Wally Cox, Sundays on NBC-TV

REYNOLDS **ALUMINUM**

CUT MACHINING COSTS WITH ALUMINUM

A typical page from the machining handbook.



for cutoff tools will vary from 0.001 to 0.0045-inch per revolution, depending upon the alloy being cut and the width of cut.

Tool widths suggested in Table I are suitable for either straight cutoff through rod or combined form and cutoff.

Table I—Suggested Cutoff Tool Widths

CUT DEPTH INCHES	CUTOFF ONLY		COMBINED FORM & CUTOFF	
	ROUND INCH	HEXAGON OR HEX INCH	ROUND INCH	HEXAGON OR HEX INCH
0.0 -0.125	0.047	0.062	0.047	0.047
0.126-0.1875	0.062	0.093	0.047	0.062
0.188-0.312	0.093	0.125	0.062	0.093
0.313-0.500	0.125	0.187	0.093	0.125
0.501-0.687	0.187	0.250	0.125	0.187
0.688-1.250	0.250	0.250	0.187	0.250

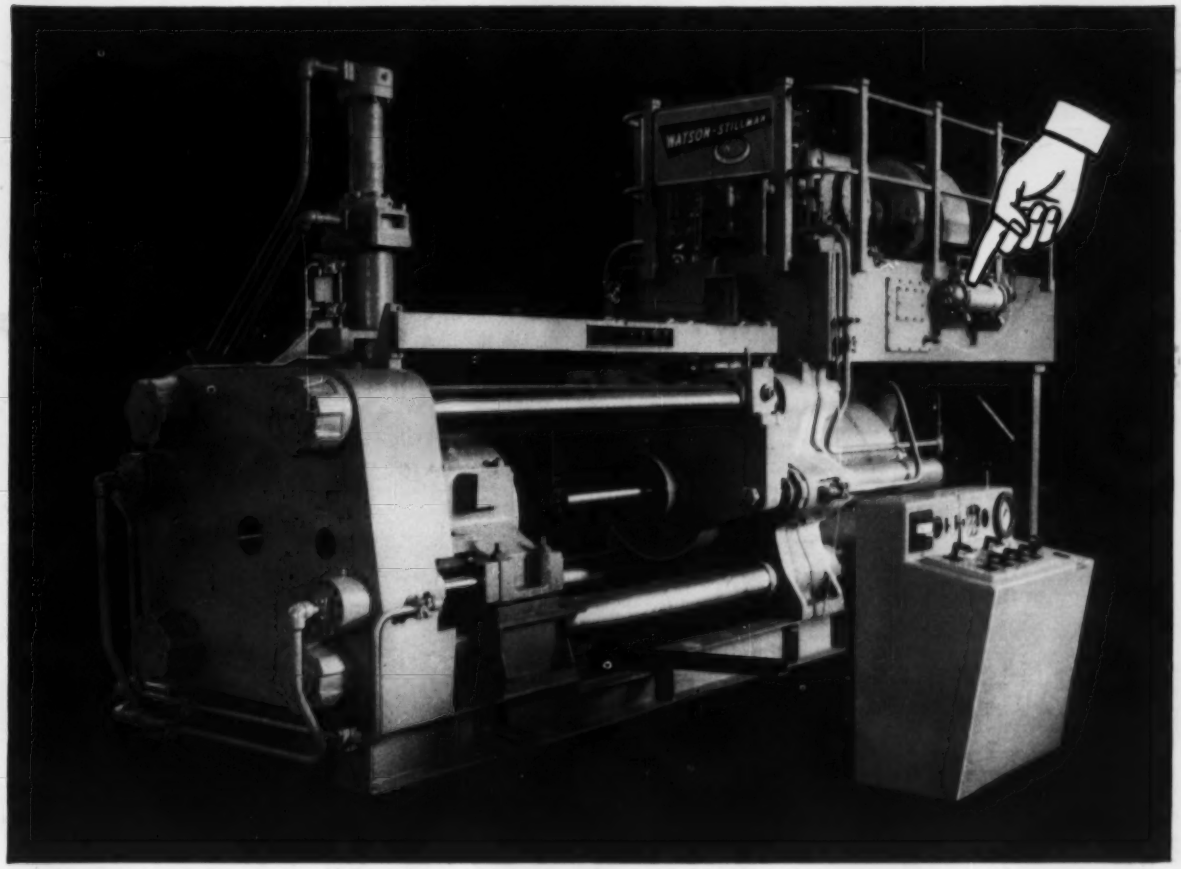
THIS HANDBOOK TELLS YOU HOW

The handiest, most helpful handbook you can get on the machining of aluminum alloys is yours for the asking. This book evaluates the various aluminum alloys and recommends machining methods and tools that give maximum production economies. There is a special section on automatic screw machining. Every designer, production engineer, plant manager and machine shop superintendent needs this 124 page "Machining Aluminum Alloys" on his desk. Single copies are available without cost when requested on your letterhead. Or call your nearby Reynolds Distributor. A complete index of technical literature is also available. *Reynolds Metals Company, Post Office Box 1800-JL, Louisville 1, Kentucky.*

See "Mister Peepers", starring Wally Cox, Sundays on NBC-TV

REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND



ROSS EXCHANGER insures full hydraulic power of this 1250-ton Watson-Stillman Extruder

With an advance speed of 440 ipm, an extrusion speed of 29 ipm and a return speed of 670 ipm, this 1250-ton Watson-Stillman Aluminum Extrusion Press has been equipped to handle billets up to 5⅛" x 24".

To maintain the full 108 gpm capacity of this extruder's multiple piston type pump, a Ross Type BCF Exchanger is furnished here. Compact and accessible, it provides safe, dependable oil cooling at all times.

Assuring the utmost in thermal efficiency and ruggedness, Ross Exchangers are regularly installed on numerous types and makes of metal working equipment: metal drawing presses, die casting machines, welders, as well as engines, compressors, lubrication systems and speed increasers . . . to cool hydraulic fluid, jacket water and lube oil.

Pre-engineered, fully standardized and stocked in a wide range of sizes, they are promptly available to answer *your* needs. Request Bulletin 1.1K5.

KEWANEE-ROSS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
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In Canada: Kewanee-Ross of Canada Limited, Toronto 5, Ont.

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"I need 6000 lbs. of structurals this afternoon--how about it?"

(A true story) It was 4:10 in the afternoon when the purchasing agent of a construction company called his desk man at Ryerson. "I need some structural channels in a hurry—12 inch, 25 pound . . . let's see, 12 pieces—that's 6000 lbs. Can I have it today? I'm really in a jam."

Ryerson's large stocks of ASTM-Spec A-7 structurals included just what was wanted. The steel was immediately cut and loaded, and at 4:35—just 25 minutes after the call—our truck rolled into the construction company's yard. They were then able to fabricate the channels in their own shop and have them in place by 11 P. M.

"I thought of Ryerson because I've always had good service from you," the customer commented later. "I know I was asking a lot, but you really came through for me!"

Whether it's your day-to-day requirements, or help in an emergency—count on Ryerson. Here are the world's largest steel stocks—unsurpassed facilities—and an organization eager and able to deliver. When you need steel—of whatever kind . . . call Ryerson.

RYERSON STEEL

Principal products in stock: bars, structurals, plates, sheets, tubing, alloy and stainless steel, re-bars, etc., also machinery and tools.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

STEEL

June 20, 1955

Metalworking Outlook

A Spur for Expansion

Look for a new wave of automotive investment in plant and equipment. It will come as a result of the settlement on supplemental unemployment payments. The purpose will be to keep up employment and to build sufficient single-shift capacity to eliminate overtime. At the latest production rates and wage scales, overtime is a big cost item. It's large enough to justify an equipment investment that would get rid of or substantially reduce that kind of labor charge.

The Dinosaur Auto

"The age of the dinosaur-type car is at its peak." So believes American Motors Corp.'s George Romney. He says his firm's main effort now is to develop a small car, the Rambler, suited to traffic conditions. Acceptance of the small car will be enhanced over the next decade by the growing number of two-car families. Mr. Romney thinks that by 1965, barring war or depression, half of all car owners will have more than one auto.

Test for Bethlehem-Youngstown Merger?

Arthur B. Homer, president of Bethlehem Steel Co., last week told a Senate Judiciary Subcommittee that Bethlehem and Youngstown Sheet & Tube Co. are considering going to court to gain approval of their proposed merger. He says the Justice department's refusal to approve the merger in effect means that Bethlehem "would be prevented from entering the markets in the Midwest in competition with many large steel companies there." Presumably, the court test would be attempted in an agreed-upon jurisdiction, with Bethlehem-Youngstown proceeding with the merger and the Justice department suing to stop the move.

A Plug for Saner Pricing Laws

Another steel executive, National Steel Corp.'s Ernest T. Weir, also appeared before a congressional committee last week. He told the House Judiciary Antimonopoly Subcommittee that he favors S. 780, sponsored by Sen. Homer Capehart (Rep., Ind.), and the companion H.R. 4824, sponsored by Rep. Francis Walter (Dem., Pa.). The two measures would write into law the opinion of the Supreme Court in the Standard Oil Co. of Indiana case, i.e., price discriminations made in good faith to meet the equally low price of a competitor are a complete defense to charges of Robinson-Patman Act violations. If passed, the law would clarify the question of whether steel companies may legally absorb freight.

Status of Steel Expansion

A report on steel capacity has been sent by the Business & Defense Services Administration to the Office of Defense Mobilization. Prepared by a steel industry task force, it reportedly makes no recommendations on

Technical Outlook—p. 109 Market Outlook—p. 145

expansion or the amount needed. Instead, it cites the small cushion of idle capacity now available and asks Defense Mobilizer Arthur Flemming to draw his own conclusions on whether expansion is needed and whether fast write-offs will be allowed. If he buys the premise, BDSA and the steel task group would go to work again to decide the details about expansion.

Emphasis on Sintering

With high-sinter practices, the nation's blast furnace capacity could be increased some 20 per cent without adding a single new unit. In the next wave of steel expansion, look for emphasis on sintering projects. Many steel companies, such as U.S. Steel Corp., already are planning new sintering plants.

A Hoover Recommendation

The Hoover Commission wants the responsibility for the industrial properties in the National Industrial Reserve and the Departmental Industrial Reserve shifted to the secretary of defense. That would involve transfer to the Pentagon from the General Services Administration of the management of machine tools and equipment in NIR.

Small Business Gains

In the first quarter, small business firms had their best period since last June, in terms of prime defense contracts awarded. They received awards for $739 million out of a military procurement total of $3.1 billion, a slight rise, percentagewise, and a substantial increase, dollarwise, over the previous two quarters.

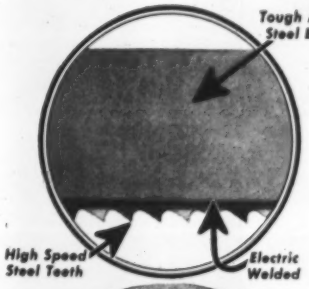
Straws in the Wind

To take the pressure off vacation resorts, Tristate Industrial Association Inc., Pittsburgh, is trying to persuade its members to close down for vacations at some period that does not include July 4 . . . Ford Motor Co. says it "hopes" the new labor pact won't boost prices . . . U.S. electrical manufacturers will need to produce three motors every second during the next five years, Westinghouse Electric Corp. reports, to power the 428 million new electrical appliances that will be sold by 1960 . . . The average age of hourly employees in the steel industry is 41.

This Week in Metalworking

Coming up in the GAW drama are higher state jobless payments (page 59) . . . The United Steelworkers of America gets down to serious bargaining this week with U.S. Steel Corp. (page 60) . . . Giddings & Lewis Machine Tool Co. has developed a Numericord control system to automate machine tools (page 61) . . . Unexpectedly good business has boosted planned plant and equipment expansion outlays to more than $27 billion for 1955 (page 62) . . . Prospects glitter for costume jewelry makers (page 70) . . . Room air conditioner sales revive (page 71).

Features Essential to Top Hack Saw Blade Performance



UNBREAKABLE—to saw FASTER.

Composite construction (a narrow high speed steel tooth edge electrically welded by the MARVEL-invented process to a tough, non-brittle alloy steel body), means that MARVEL high-speed-edge can be subjected to the MAXIMUM feed pressure that any hack sawing machine is capable of applying. MARVEL blades need not be "babied" for fear of breakage!

SHATTERPROOF—for SAFETY.

MARVEL blades never shatter or "explode" as do the ordinary "brittle" blades shown at left which so often cause personal-injury accidents such as the loss of an eye or severe laceration and expensive damage to the sawing machine. Operators who use MARVEL blades exclusively soon "get the habit" to apply heavier feeds, greater blade tension, higher speeds—to do their work faster, because they know they are SAFE with MARVEL.

SHARPER, PREMIUM-STEEL TEETH—to wear LONGER.

Teeth are accurately machined by a MARVEL-invented process that assures sharper tooth points and positive uniformity of tooth shape and degree of set from end-to-end of every MARVEL blade. The steel used in the tooth edge is carefully selected from the finest high speed steels available throughout the world, regardless of cost or source—truly premium steels, without premium cost.

QUALITY CONTROL—to assure UNIFORMITY.

With more than a quarter century of *experience* in inventing, perfecting, and producing welded-edge hack saw blades, MARVEL has provided its own laboratory with the most modern metallurgical instruments and techniques known to the applicable sciences for the specific purpose of maintaining highest possible quality control. Coupled with rigid tests and meticulous inspection of every MARVEL blade, uniform quality is assured.

These are only a few features that make MARVEL High-Speed-Edge Blades such outstanding performers.

Ask for the latest MARVEL Cutting Tool Bulletin and the name of your closest MARVEL Distributor.

MARVEL Metal Cutting SAWS
Better Machines–Better Blades

Manufactured only by
ARMSTRONG-BLUM MFG. CO. • 5700 West Bloomingdale Avenue • Chicago 39, U.S.A.

Heavy tooth loads require gears of Nickel Alloyed Steel

For high compression strength and wear resistance

THE GEARS BELOW actuate movements of a giant, high-speed earthmover.

When the machine scrapes up a 23 cubic yard bite of earth to haul away at almost 30 miles per hour, the gears often carry extremely heavy loads.

But any reasonable set of demands can be met by use of nickel alloyed steels . . .

For Example

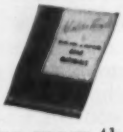
Where you need maximum wear resistance in the surface, plus all the surface compressive strength you can get, use a nickel alloy *carburizing* steel.

These steels provide extremely tough cores that resist shock loads, fatigue and bending stresses. In addition, they minimize the distortion in heat treatment which is a major cause of noisy gears.

Where tooth loading is heavy, but surface compressive stresses and wear are not extreme, use a *direct hardened* nickel alloyed steel. It will give you the needed strength more consistently and in heavier sections than carbon grades.

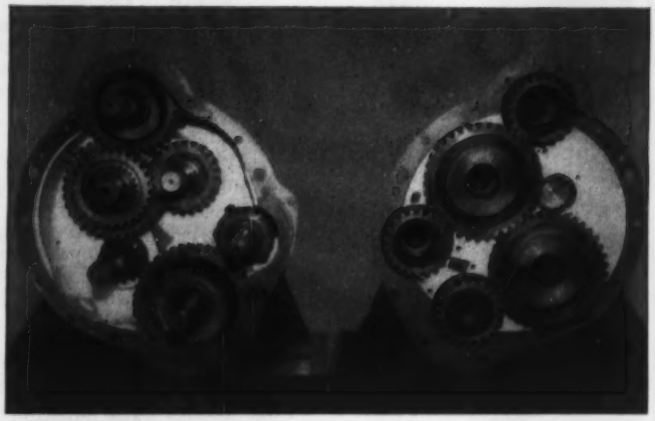
Generally, steels containing nickel offer high resistance to shock, fatigue and multiaxial stresses. Moreover, you can readily machine nickel alloy steels before final heat treatment.

Booklet gives complete story



Meet the demand for gears that permit high speeds and heavy loads. For gears that run smooth . . . last long. Every engineer and designer should have a copy of "Modern Trends in Nickel Steel and Cast Iron Gear Materials." This illustrated booklet contains a wealth of information and data. It may be exactly what you want. It's yours for the asking. Write for your copy now.

INCO TRADE MARK



Gears and Pinions of nickel alloyed steel stand the gaff in earth-moving equipment produced by Le Tourneau-Westinghouse Co., Peoria, Ill. The grades of steel used include 3310-H and 4820-H for severe duty, 4320-H for medium heavy service and 8620-H for relatively lighter tooth loads.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 Wall Street New York 5, N.Y.

Tool for Managers

On page 99, we present STEEL's Simplified Guide for Re-Equipment.

Wise equipment replacement is a must for today's metalworking managers. Equipment makers are bringing out new models that offer tremendous increases in efficiency. Machine tool builders are preparing items for their fall show that promise significant gains over models offered only a few years ago.

The smart manager must consider not only the cost of replacement. He also must consider the cost of nonreplacement. He must be informed on what's new in the equipment market. He must know the operating costs in his own plant. Then he needs a system that will indicate when replacement is profitable.

This is where STEEL's Simplified Guide steps into the picture. It can be used on individual machines or on groups of equipment. Its terminology is familiar and easily understood. Make the right entries and you'll get a right answer.

Before publication, we showed the Guide to a score of re-equipment experts. Their suggestions and modifications are incorporated into the final form. They believe this simple worksheet will give you accurate answers to the replacement timing problem. Obviously, the Guide owes a debt to the Machinery & Allied Products Institute whose MAPI formula is its more complicated ancestor.

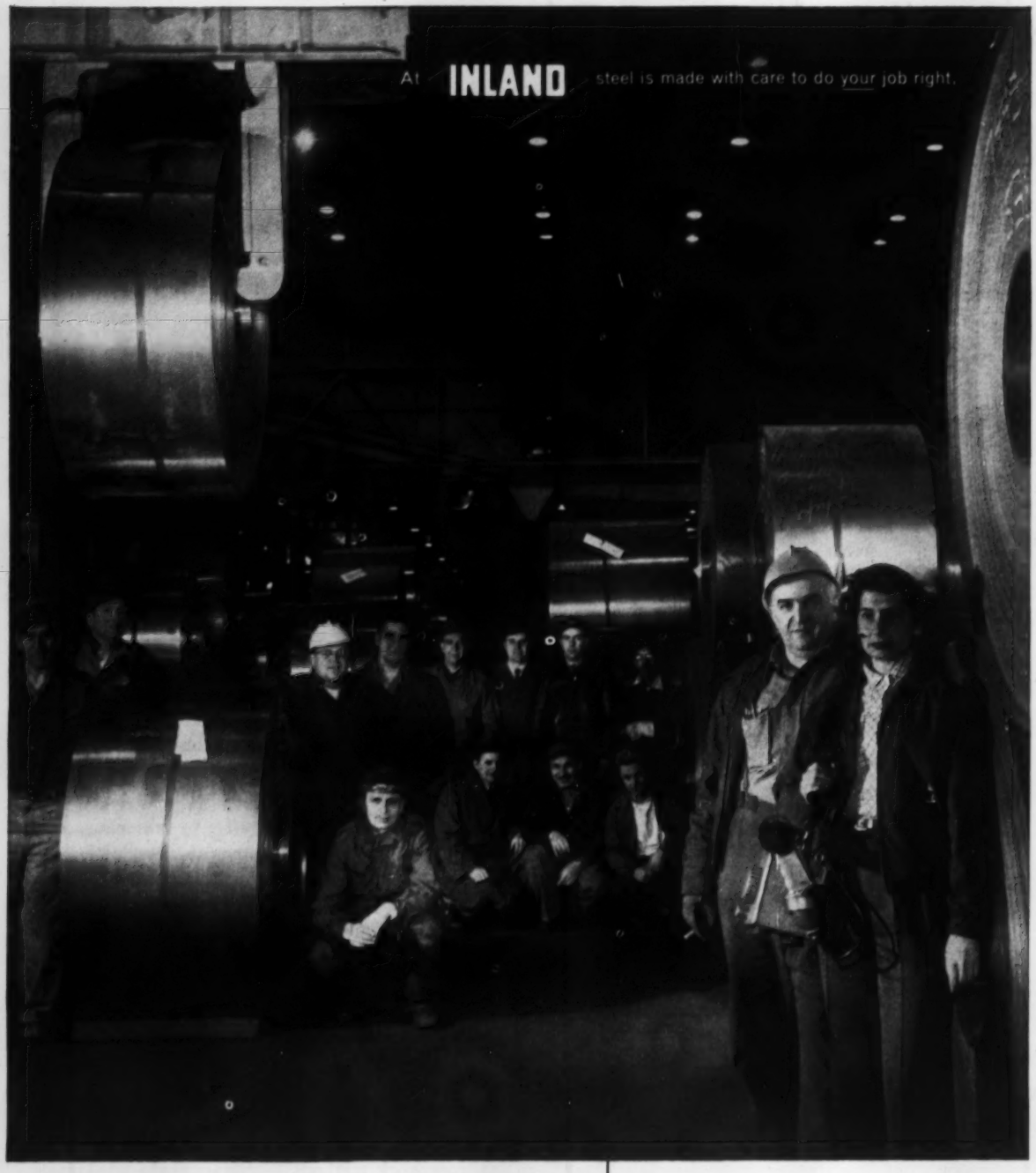
While intended primarily as an aid for deciding replacements, we expect the Guide will be put to other uses by ingenious metalworking men. In the expanding economy ahead, they may use it as a guide for re-equipment to enlarge capacity. They may use it as a comparative guide in the selection of new equipment for new plants. They may use it to compare the costs of new capacity vs. subcontracting manufacture.

The old rules-of-thumb, the hunch and guesswork methods of replacement are as obsolete as metalworking equipment of the World War I era.

Try the simplified Guide on your equipment.

Walter J. Campbell

MANAGING EDITOR



THESE INLAND PEOPLE CAN TELL US "NO" (AND FREQUENTLY DO)

The power of veto is delegated to many people at Inland, any one of whom can turn thumbs down on our steel, somewhere along the line, if it isn't right for your job. Take cold rolled sheets, for example. Inland encourages this negative attitude on the part of the individuals in this photo, who are concerned with quality control at various stages of steel production. Their vigilance assures you of uniformly good quality steel, order after order, year after year.

INLAND STEEL COMPANY
38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul Davenport • St. Louis • Kansas City • Indianapolis Detroit • New York

Principal Products: Sheets • Strip • Structural Shapes • Plates • Bars • Tin Mill Products • Rails and Track Accessories • Coal Chemicals

What States Provide in Unemployment Payments

(maximum weekly benefits only)

Alabama	$22.00	Louisiana	$25.00	N. Dakota	$35.00*
Arizona	30.00*	Maine	30.00	Ohio	35.00
Arkansas	26.00*	Maryland	38.00	Oklahoma	28.00
California	33.00	Massachusetts	25.00†	Oregon	25.00
Colorado	28.00	Michigan	42.00	Pennsylvania	35.00
Connecticut	45.00	Minnesota	33.00*	Rhode Island	30.00‡
Delaware	35.00	Mississippi	30.00	S. Carolina	26.00*
D. C.	30.00	Missouri	25.00	S. Dakota	25.00
Florida	26.00	Montana	26.00	Tennessee	30.00
Georgia	26.00	Nebraska	28.00	Texas	20.00
Idaho	30.00*	Nevada	50.00	Utah	33.00*
Illinois	27.00	New Hampshire	32.00	Vermont	28.00
Indiana	30.00*	New Jersey	30.00	Virginia	24.00
Iowa	30.00*	New Mexico	30.00	Washington	35.00*
Kansas	32.00*	New York	36.00*	West Virginia	30.00
Kentucky	28.00	N. Carolina	30.00	Wisconsin	33.00
				Wyoming	36.00

* Effective July, 1955.
† Plus $3 for each dependent—not more than average wage of all employees in state.
‡ Effective January, 1956.
Source: Commerce Clearing House

Coming in GAW Drama: Higher State Jobless Pay

"WE'RE WILLING to join with our employees to seek new laws in the state legislature which would provide all workers with a minimum of half their take-home pay during times of unemployment."

This statement by R. S. Livingstone, vice president-personnel, Thompson Products Inc., sums up what many management people think may be the answer to GAW—increased state unemployment benefits.

Disagreement—All are not in accord. One official states: "We don't have a layoff problem. Why should we pay more into state unemployment funds?" The National Association of Manufacturers is quick to point out that all state unemployment compensation benefits are being paid via payroll taxes by the employer—a "fact almost entirely forgotten in the welter of debate," says NAM.

General Electric Co. and many others support a bill in the Ohio legislature which would up unemployment benefits some 10 per cent (although last week the measure was virtually killed for this session, it's certain to be revived). GE feels that any sudden doubling of state unemployment compensation would increase the tax load too much for companies to bear.

Trend?—Some 23 states and the District of Columbia already have increased maximum jobless pay weekly benefits since the first of the year, reports Commerce Clearing House. The average amount going to workers each week is $30.79. Previously it was $26.27. State-by-state benefits range from $20 to $50 (see table). Other bills under consideration in legislatures still in session would increase maximum benefits as follows: Illinois, $3 to $13; Massachusetts, $5; Ohio, $7 to $24 (virtually killed for this session).

Michigan has a new law awaiting the governor's signature which would increase weekly compensation by $12. Texas is ironing out differences between house and senate versions which would increase benefits about $5. Wisconsin's bill calls for an increase of $3, while New Jersey's assembly has passed a bill for a $5 raise.

Jumbled — While there still is much confusion, only two states specifically state that workers can receive unemployment pay while drawing supplementary unemployment wages from a company. Five states have specific laws that may be interpreted as prohibiting workers from receiving both types of pay. The remaining states still are tied up in legal unsnarling. The legislature in Ohio, one of the uncertain states, declined to clarify its laws. "It's too soon," said one legislator. "We need time to study this thing."

Landslide? — Despite legislative

stoppers, Walter Reuther continues to press for the Ford-GM type contract. Next in line is American Motors Corp. George Romney, president, American Motors, states: "The autoworker's union has been unwilling in the past to make agreements fit into the particular economic situation of the smaller automakers. It is our intention to insist on collective bargaining this year, based on the economic facts of American Motors, not Ford and General Motors."

According to Mr. Romney, American Motors has been operating in the black since February, but the company still has not realized the full benefit of its merger.

"Here," states a labor relations expert, "is the crux of the problem. Not everybody can afford the Ford-GM type settlement—even in the auto industry. And many other industries aren't doing nearly so well as autos. What's more, even if everyone got SUP (supplemental unemployment payments), some workers would be getting a contract calling for 60 per cent, some 50 per cent, etc. There would be no uniformity."

Less Pain—Dr. Jules Backman, professor of economics, New York University, states: "Adequate state unemployment compensation will do a better job of alleviating some of the pain that attends unemployment." He points out that this course will benefit a larger number of workers, including low seniority employees who would be most likely to need help.

Some companies that are not unionized agree that a rise in state unemployment legislation would help.

GM Solution—Harlow H. Curtice, president, General Motors Corp., who has accepted the GM settlement with something less than enthusiasm, states: "I earnestly believe that the responsibility for determining the amount and duration of unemployment benefits rests with the legislatures of the various states."

GM settled for about the same contract as Ford, but did agree to a wage inequity fund which can amount to as much as 2 cents an hour on the total hourly payroll. This fund will provide for adjustment of inequities in wage rate classifications. This gives GM three funds under its new contract, which, if ratified by the union membership on June 29, will be retroactive to last May 29. The three funds include a pension trust, wage inequities and a $150-million trust fund for layoff benefit payments.

There will be much talk about GAW and SUP in the coming weeks. Some say that the whole problem parallels the labor pension situation. As federal old age payments have risen, the company-paid supplements (really what the "pensions" are) need not be so high. In jobless benefits, too, rising state payments may eventually make the privately supported GAW a "toothless dragon" (STEEL, June 13, p. 66).

Steel Pension Plan Improved

Allegheny Ludlum Steel Corp. negotiated a broadened pension plan with the CIO United Steelworkers.

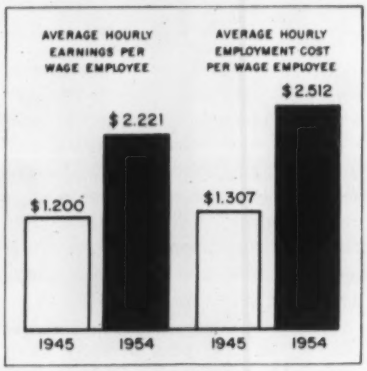
The new plan gives employees the option to extend their pension payments to their widows or other dependents. Up to age of 60, employees can sign up for such pensions at reduced monthly rates.

The agreement is similar to the one made two months ago by Bethlehem Steel Corp. and the United Steelworkers.

Heppenstall Enlarges Facilities

Englarged and improved facilities for the design and manufacture of materials handling equipment have been placed in service by Heppenstall Co., Pittsburgh. These operations have been transferred to New Brighton, Pa., where a former forgings plant has been practically rebuilt for this purpose. Operations start with the cutting of rolled steel plate, followed by such steps as heat treating, machining, assembling and testing. Forged parts required for the equipment are produced at the Pittsburgh plant. Edward Stumm is superintendent at New Brighton.

Pattern for Steel Industry Wages



Source: American Iron & Steel Institute

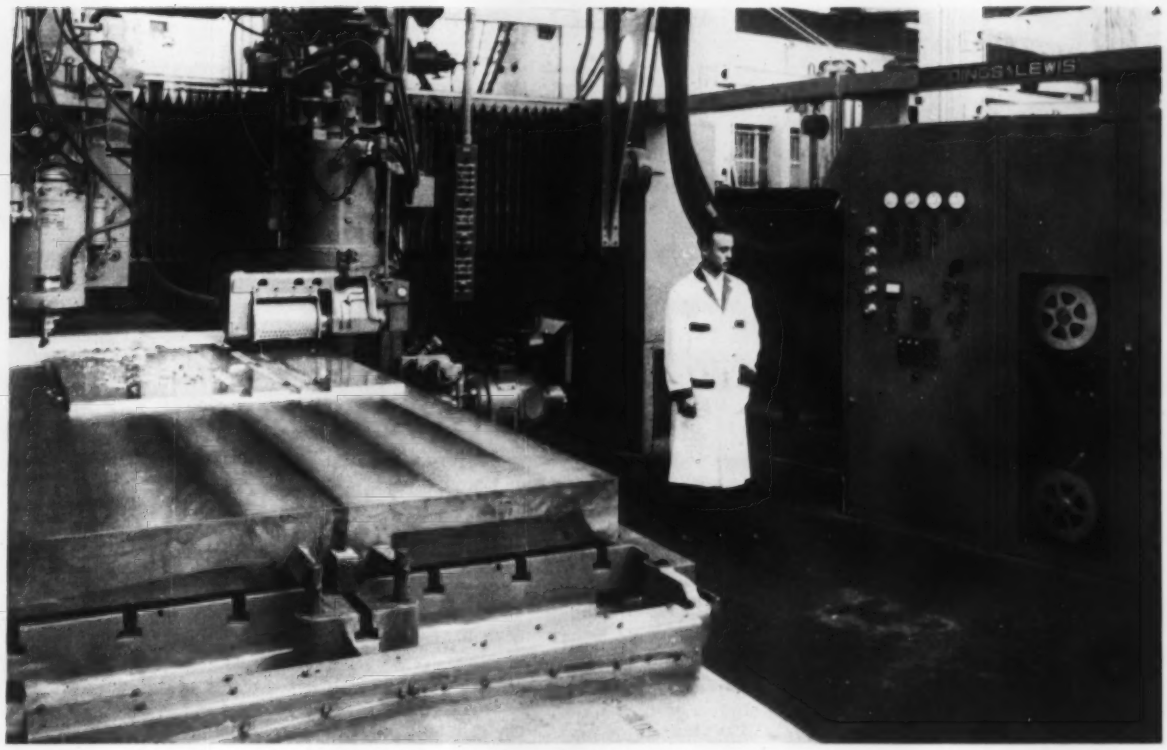
SOMEWHERE between 7½ and 20 cents.

Those are the limits within which the steel wage issue will be settled. Both have been preset by the Ford-UAW agreement. The lower figure represents the immediate cash cost of that contract in hourly wages; the ceiling is the cost of the complete package.

Challenge—Anything above 7½-cents an hour (already spurned by David J. McDonald) will top the average autoworker's hourly wage. With the new agreement, this figures at $2.34 an hour. Steelworkers are already making close to a $2.27 hourly average, including overtime. In 1954, calculates the American Iron & Steel Institute, their average was $2.22 an hour; total payroll was $2.8 billion.

This is not the complete story on the steel industry's wage bill. Supplements to wages, including pensions, insurance, vacations and social security, cost employers an additional 29.1 cents an hour. The 1954 total wage cost hit a high of $2.512 per man per hour, up 92 per cent from the 1945 level.

Gain—Between 1940 and 1954, the AISI reports that steel industry employment rose only 14 per cent, from 511,000 to 582,000. On the other hand, the increase in wages and salaries was 211 per cent, not counting "fringe" benefits.



Automation in Action: Numericord Control System

"AN ARCHIMEDEAN spiral is next," said the narrator. As magnetic tape reels in the auxiliary panel began to turn, the aircraft skin milling machine at the left in the above photo spun into action without human guidance.

The spiral, of course, plays no part in a skin panel for a jet plane. But it served as the "spectacular" to Giddings & Lewis Machine Tool Co.'s demonstration of its new Numericord control system for machine tools in Fond du Lac, Wis.

Reveals Trend — Two factors stood out: 1. The demonstration was a preview of new developments to expect at September's National Machine Tool Show. 2. The gap between what must be done by skilled craftsmen and what's possible by automation is narrowing.

The new system combines both electronic "brain" and magnetic "memory" functions to automatically control heavy-duty machines capable of handling large, complicated workpieces. Cycles involving as many as five machine axes and 22 auxiliary machine functions are possible. Identical parts in any quantity can be produced to tolerances ranging plus or minus 0.001 to 0.002 in.

Here's How—Three years in development, through G & L sponsored research at Massachusetts Institute of Technology and allied research at General Electric Co., the system works like this:

1. Calculated decimal information taken from the part blueprint, tool data and machine feed and speed rates are fed via a simple keyboard into a paper tape preparing unit.

2. The paper tape then goes into a computing director which converts the decimal numerical data into time-controlled, continuous electrical signals.

3. A magnetic tape recorder impresses these electrical signals from the director onto appropriate channels (14) of the master magnetic tape.

4. The magnetic tape "playback" and machine control unit "reads" the tape to control the machine tool automatically. Servomechanisms accurately control all axes movements of the machine by means of "telltale" feedback synchros in a closed-loop circuit.

Verbal Orders — A novel, but practical, feature of the system is that "spoken" commands can be placed on the unused channels of the magnetic tape to give directions to the machine attendant. Examples: Approaching inspection stops, completion of cycles, tool change warnings.

Estimates indicate that for aircraft configuration work, like a jet horizontal stabilizer, at least a 50 per cent saving in machining time over manually-operated methods is possible with the Numericord. The magnetic tape comes in 4800-ft lengths, enough to operate the machine for an hour.

Reduced or eliminated are such operations as tool setting, gaging, template changing and positioning. Avoided, too, are time and material losses resulting from wasted operator motions, lack of skill, miscalculations and human error.

Applications—In addition to the

spar and skin milling machine demonstrated, the system will control horizontal boring, drilling and milling machines; planer-type millers; and vertical boring mills.

Significant, too, are the defense implications, officials point out. The system's ability to "store" skill on the magnetic tape permits the release of highly-trained operators for other duties. Master tapes covering all parts of prototype planes or other military items can be stored in a safe location awaiting emergency orders for all-out production. Vital production also can be transferred from one plant to another in a matter of hours by "storing" skills on magnetic tape.

U. S. Steel Plans Expansion

U. S. Steel Corp., Pittsburgh, has requested the Office of Defense Mobilization for certificates of necessity on facilities worth $218 million.

At Duquesne, Pa., a $75-million proposal includes "general improvements at the entire works, open hearths, blast furnaces and rolling mills." A $25-million project at Houseville, Pa., is planned for ore sintering facilities.

Other projects are for an $88 million improvement at the South Chicago, Ill., works and $30 million at the Fairless works in Fairless Hill, Pa.

Malleable Founders Optimistic

Malleable iron castings could set a new record this year, says Charles E. Brust, president, Malleable Founders' Society.

Also president of Eastern Malleable Iron Co., Naugatuck, Conn., Mr. Brust looks at the situation this way: "Such predictions are, of course, qualified by conditions in the automotive industry. However, it is not unreasonable to anticipate total production for the year on the order of 950,000 tons which would be an increase of about 15 per cent over 1954. Shipments in March are highest for any single month in history, 102,364 tons. With a high level of business activity for the balance of the year, as now predicted by some forecasters, total shipments for the year could conceivably surpass the all-time record high of 1,080,000 tons in 1951."

As the business boom gains authority . . .

Capital Spending Revives

BUSINESS is accelerating its capital equipment spending. Outlays should exceed $27 billion this year, compared with $26.8 billion in 1954, $28.3 billion in 1953 and $26.5 billion in 1952.

Metalworking is setting the pace for the rest of industry, indicates the Securities & Exchange Commission and the Commerce department. The largest increases from early 1955 spending rates are anticipated by the steel, nonferrous metals, auto and other transportation equipment industries.

Spurs—Several factors are forcing the upswing. Basically, metalworking must continue to spend for plant and equipment to stay up with the competitive march. But high consumer spending, the new emphasis on defense mobilization, climbing wages and the need for cutting costs and high research spending also are cogent reasons.

The primary iron and steel industries plan to up their spending from $154 million for the first quarter to $212 and $206 million in the second and third quarters. Primary nonferrous metals will spend $58 million in the second quarter and $66 million in the third, as against $41 million in the first.

More — Transportation equipment makers will spend $348 million and $384 million in the second and third quarters. They spent $272 million in the first quarter. The electrical machinery industry will up its investment in new plant and machinery $314 million by the end of September, the nonelectrical machinery industry by $667 million.

Big Picture — For industry at large, the forecast rate of third quarter expenditure matches that of the peak third quarter of 1953. Since then, industry's expenditures for capital improvements have declined steadily through the first quarter of this year.

But now the business boom is sufficiently solid for businessmen to put their money behind it. After seasonal allowances, capital outlays projected by manufacturing and commercial companies are about 10 per cent higher than expenditures in the first three months. Even larger relative increases are expected by the railroad, public utility and mining companies.

Outlook—If spending continues at the average for the second and third quarters through the last quarter this year, we will have the second highest year on record for industry as a whole. Outlays might well be $1 billion ahead of 1954.

New Plant & Equipment Spending Climbs

(annual rate: billions of dollars)

	1955		
	Jan.-Mar.	Apr.-June	July-Sept.
Manufacturing	10.17	11.22	11.30
Durable goods industries	4.78	5.21	5.38
Nondurable goods industries	5.39	6.01	5.92
Mining	0.80	0.94	0.95
Railroad	0.74	0.80	0.86
Transportation, other than rail	1.46	1.58	1.62
Public utilities	4.01	4.37	4.77
Commercial and other	8.46	8.96	9.34
TOTAL	25.65	27.86	28.83

Source: Securities & Exchange Commission and Commerce department

White Motor Co.

Big Truck Outlook: Business Shifts to High

HEAVY TRUCK output may roll up a record this year.

Producers of crosscountry cargo carriers of more than 16,000 lb gross vehicle weight have watched their volume grow from 63,922 units in 1946 to 185,541 in 1953, says the Automobile Manufacturers Association.

Performance—That the trend is continuing is evidenced by unofficial reports that output of heavy trucks versus total truck volume is up about 3 per cent over 1954. Makers like Diamond T, with a 1500-unit order backlog, report monthly output schedules top any since 1953.

GMC output reached a second consecutive all-time monthly peak in May, and the outlook for June is even better. International Harvester has been working overtime since March. Its production is highest since April, 1953. A 9-hour day is reported by Mack. White, which hit a 20-month high of 1185 units in March, is programming June output at 1425.

Growth Factors—Booming highway construction is one spur. Heavy trucks are needed to build the roads. Better roads make possible the economical operation of more heavy trucks.

A second factor: When industrial production is high and construction is moving, over-the-road tonnages are up as well.

Old Story — Then there's the matter of obsolescence. Seventy per cent of all trucks sold in 1953 replaced scrapped trucks. At present, 22 per cent of operating trucks are prewar models, better than half are more than five years old. Although many turn 500,000 miles or more before being scrapped, more than 2 million sold during the 1947-48 postwar boom may be up for replacement soon.

Truckmakers are giving obsolescence a helping hand. New designs combine lighter weight and greater capacity. Engines are more powerful and economical. Cabs have been improved to give more comfort, better visibility and driver efficiency. Maintenance features, like the tilt-cab used by White, Diamond T and International Harvester, are strong selling points. Styling also figures in the picture—GMC trucks got the hand of Harley Earl, vice president, styling, this year.

Future—State legislatures, too, have a hand in truck obsolescence. Changes in permissible truck-trailer length, axle loads and similar restrictions make changes increasingly necessary to maintain something close to optimum payloads. Movement toward the standardization of these regulations from state to state is another influence behind buying.

One truckmaker sums up this way: "Everything points to continuing good business in the heavy truck field. Not only is hauled tonnage increasing, but the road-building program promises that operators will be able to continue to increase their efficiency. That means more business for them and more business for us."

Metalworking Aids Road Safety

Road accessory producers use more aluminum and steel to bring added protection to the highway as road construction mounts

A FULL HIGHWAY program will call for a record number of accessories this year. Guide rails, road signs, lighting standards and traffic control equipment sales will hit a new peak of $200 million.

Research by producers of road accessories will help keep driving headaches to a minimum on new superhighways. The fast turnpike driver must see signs sooner. Metalworking is meeting this challenge with permanent, large signs, made of sheet steel or aluminum for durability.

Changed Concept—Sign visibility is being approached from a new angle. Union Metal Mfg. Co., Canton, O., reports that it has developed steel tubing columns and crossbeams for mounting signs overhead. Signs are placed directly over the lane affected. This solves the problem of having cars in neighboring lanes block out roadside warning signs.

Producers also are striving to have "honest" messages on signs. Union Switch & Signal Division, Westinghouse Air Brake Co., states: "A warning sign must be honest, or the driver will ignore the next one."

Another Facet—"There's a rapid increase in reflectorized signs and permanent objects," says Prismo Safety Corp., Huntingdon, Pa. Safety-conscious signmakers are using greater amounts of Prismo's glass spheres embedded in a binder.

Aluminum Co. of America points out that highway engineers are planning to use more aluminum. Alcoa predicts that there will be a great increase in the application of aluminum in railings, signs and lighting standards. Some 2442 aluminum signs are being installed on the new 241-mile Ohio turnpike. Aluminum railings will line 200,000 ft of its bridges. Newest need for aluminum: A shaft for fog-dispersing machines on the New Jersey turnpike.

Why Aluminum? — The biggest asset of aluminum alloy is its corrosion resistance which helps cut maintenance costs, comments Hubbard Aluminum Products Division of Hubbard & Co., Pittsburgh. States bordering oceans are showing the greatest interest in aluminum railing. The lightness of aluminum also cuts installation costs and eliminates need for painting.

Lighting accessories are also undergoing changes. Drivers require lighting of higher intensity and better light distribution. Lights are being elevated more, and longer arms to hold the light fixtures are being designed so that each light can be positioned above the center of multilane highways.

"Turnpike construction is also going to require tollgates and tollhouses," reports the Porcelain Enamel Institute Inc., Washington. "Porcelain enamel on steel is being used in this construction. There also is an increase in the number of signs (aluminum) being porcelainized."

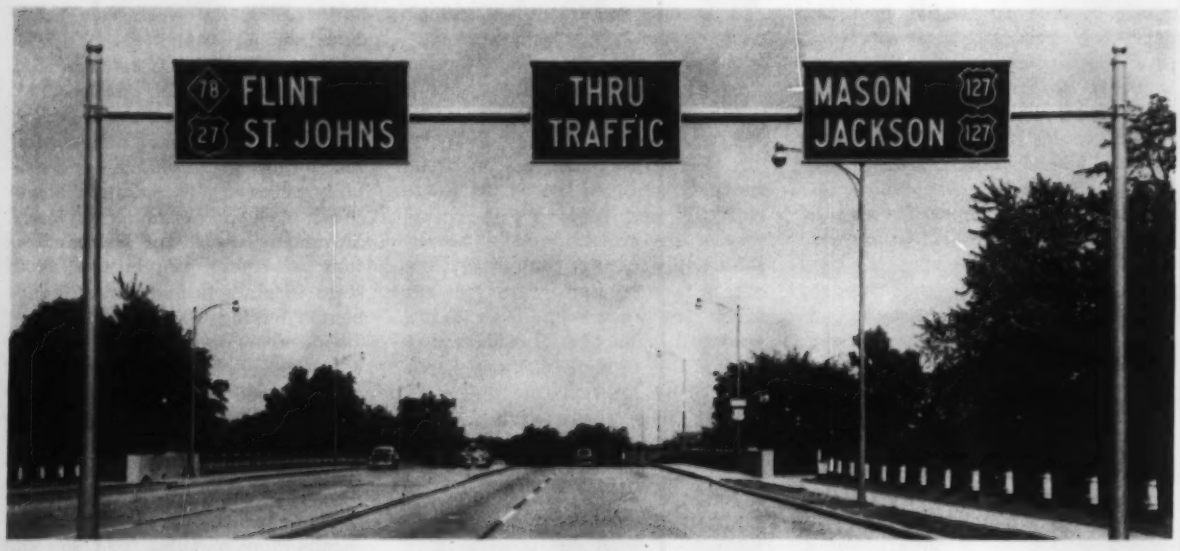
Other Sales—There also is plenty of replacement demand. One example: Many states are converting from yellow to red background stop signs for greater visibility.

When you hit the road for your vacation, take a look. Metalworking products are making the road a better and safer place on which to drive.

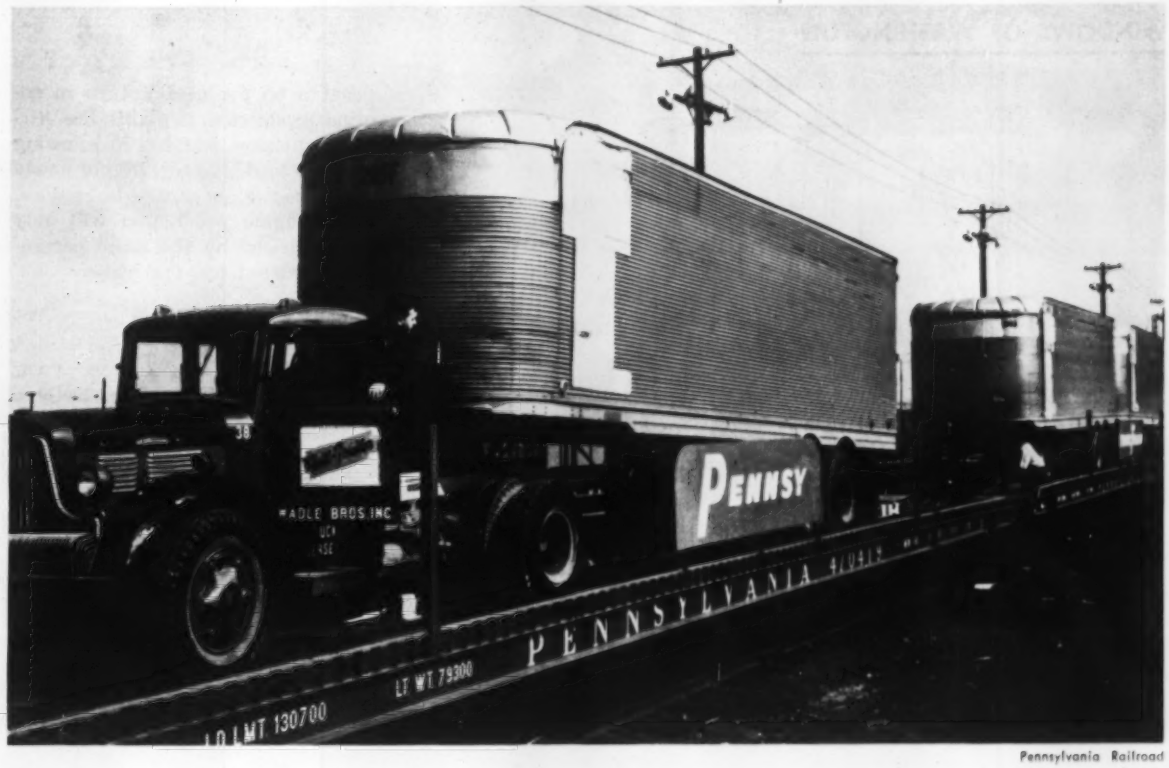
$65 Million for Turboprops

American Airlines Inc. ordered 35 turboprop planes, 4-engine, 65-passenger giants, from Lockheed Aircraft Corp., Burbank, Calif. American will use the 400-mph planes on flights up to 2000 miles. Delivery schedule: Between late 1958 and mid-1959.

Featuring built-in loading steps, the plane is 101 ft long and has a wing span of 95 ft.



Overhead signs increase safety



Pennsylvania Railroad

Growing shipper interest, expanding service mean . . .

Piggybacking Is Here To Stay

SHIPPERS like piggyback. Railroads like piggyback. Truckers aren't so sure: "Railroads are the competition, so we're not too enthusiastic," is how one midwest trucking firm puts it.

Two things are certain: Piggybacking is here to stay; piggybacking is growing. James P. Newell, vice president, Pennsylvania Railroad, says: "In May, we had 944 loads under common carrier (through Rail Trailer Co.) and 1220 under our own piggyback operation. Total: 2164, highest since we began June 16, 1954.

Infant—"May produced piggybacking gross revenue at the annual rate of $5 million. We consider the service in its infancy and are enthusiastic about its growth. We're convinced the idea is sound and here to stay."

More growth is ahead. "Piggybacking is one of the most important transportation developments of our lifetime," says Harry W. Von Willer, vice president, Erie Railroad.

Shippers like the service, though many say it's still experimental with them. Cited in piggyback's favor are:

Dependability — Piggybacks so far have been kept on a close scheduling; deliveries are on time.

Speed—In regular rail service, cars may be tied up in freight yards for several days before they are transferred to the unloading point. Piggybacks are taken off their flatcars and sent on their way as soon as they get in.

For example, a Youngstown area shipper gets delivery to Chicago in less than two days via piggyback; conventional rail shipment takes about five days. From Cleveland to Chicago is an overnight hop with piggyback—about the same as trucks, compared with three or four days by straight rail.

Less damage—"We've never had a claim on piggyback," says Bruce B. Norton, traffic manager, Lincoln Electric Co., Cleveland. Loss and damage claims for railroads in 1954 were about $1.68 per $100 of revenue. With piggyback, the high reported is 13 cents per $100. Some railroads report no damage claims.

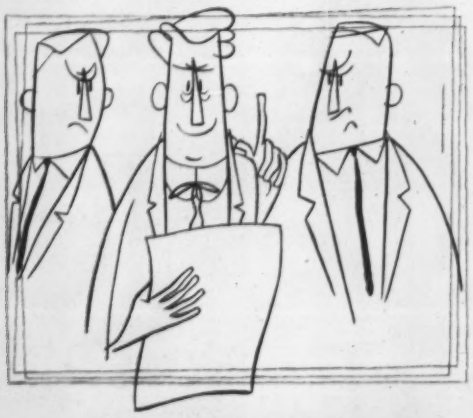
Some direct savings are possible with piggyback, but in the main, rates are about the same as those of trucks. Some, however, run as much as 8 to 15 cents lower per 100 lb.

Limiting the growth of piggyback is its newness. It has to be sold for one thing. Service now is to certain major terminal points, but more cities are being added to piggyback service as demand grows. The railroads aren't interchanging piggybacks the same way they haul one another's freight cars. But it's starting, and more work is being done on it.

AEC To Spend $2 Billion

In fiscal 1956, the Atomic Energy Commission expects to spend $2 billion.

A sharp increase is planned to develop a nuclear aircraft engine. Nearly $38 million will be spent for its development in 1956.



Renegotiation: Few Like It, but...

PARADOX IN renegotiation: President Eisenhower doesn't really want it, especially after a study showed that the cost of administering renegotiation is nearly as great as the amount recovered; industry is strongly against it; even some congressmen are cool about it.

Yet, the Renegotiation Act will be extended. Enough politically minded congressmen like it to assure the move.

Changed Position — They have persuaded the President that it is politically desirable, so he has shifted his stand. They argue: 1. Modern military equipment is so complex that it does not allow accurate procurement pricing. 2. In some instances, there is a lack of normal competition. 3. It is the one protection the government has against industry charging unreasonable prices.

Appearing before the Senate Finance committee, the Machinery & Allied Products Institute replied in part: "The military services have unparalleled experience in procurement. They have more than a decade of experience in dealing with the specialized problems raised by procurement of novel and complex military equipment."

Where's Danger?—It also was pointed out by the National Association of Manufacturers, MAPI and the Chamber of Commerce of the U. S. that competition is at a high peak and that over-all defense spending for fiscal 1955 was $41 billion. By subtracting $25 billion for pay, services and current operation of the Armed Services, only $16 billion was spent for major procurement and construction, including atomic energy and research and development. This represents less than 5 per cent of the nation's current $365 billion output of goods and services. "This," says MAPI, "does not present a picture of all-out mobilization choking off competitive markets and making orderly pricing of needed armaments impossible."

Theron J. Rice, manager of the U. S. Chamber of Commerce's National Defense Department, advised the committee that efficient, low-cost producers have little interest in selling to the government because of renegotiation.

One Reason—Some firms still are being renegotiated on their 1951 business after being repeatedly asked for waivers because the period of limitations expired.

Look for the Senate committee to recommend that an objective study be conducted to consider all the "facts." But it also will O.K. a short-term extension. The House, with H.R. 4904, already has approved a new two-year lease on life.

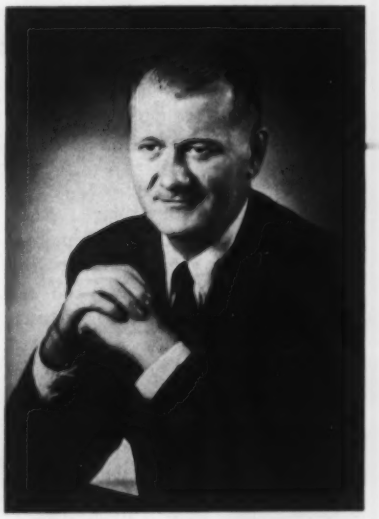
B-52 Engine Speed-Up, Too

Five years ago an order for a 35 per cent speed-up on almost any plane would have called for at least a 65 per cent upturn in engine production, explains the Aircraft division, BDSA. Now, owing to improved engine life and newly developed maintenance techniques, B-52 engine production will only be increased by the same percentage ordered for the plane.

DPA Sidelight

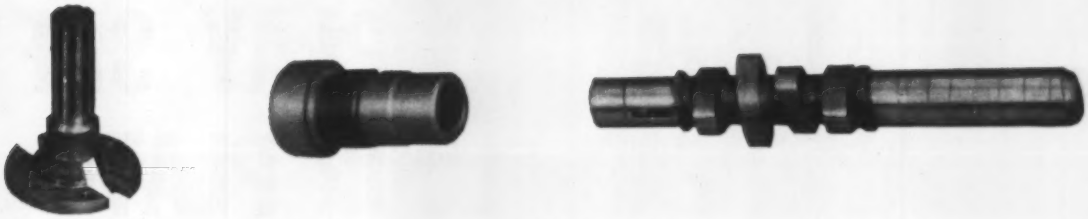
With the Washington "war games" completed, the Defense Production Act now will receive prompt attention.

A point to remember: Because the President does not want to ask for price and wage controls does not mean that he is against such stand-by authority. He realizes that controls are necessary in an emergency but is willing to wait for such circumstances before requesting them. President Eisenhower will take them at any time if Congress decides to "give" him such authority.



Meet William Thomas: He is the new director of the General Industrial Equipment Division, Business & Defense Services Administration, and can be contacted in Washington by calling Sterling 3-9200, Ext. 4329.

Mr. Thomas is on leave from Air Products Inc. where he is manager of government sales. As a lieutenant commander during World War II, he was assigned to the Engineering division of the Bureau of Aeronautics, specializing in the selection of oxygen equipment.



what's new?

NUMBER 32 OF A SERIES

seven hardening jobs on one flamatic

You might look for a lot of fancy tooling on the Standard Flamatic that hardens all these jobs. You won't find it.

Instead, you'll find a single, work-holding fixture and two pairs of standard flame heads, changed over in minutes to switch from one job to the next. These parts are made by a manufacturer of automotive transmissions whose schedules and varying lot sizes make the heat treating virtually a job-shop operation.

Flamatic keeps the pace, maintains part-to-part uniformity, holds costs in line, and gives the maintenance people practically no trouble. Flamatic holds temperatures in line with electronic control; operation is pushbutton except for loading.

To find out how versatile Flamatic selective hardening can be, write for Publication No. M-1861.

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THE CINCINNATI MILLING MACHINE CO.
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Jal-Tread floor plate combines the strength and durability of high quality steel with a neat, distinctive checkerboard pattern scientifically designed for *safety*.

Whatever your application . . . in new construction . . . new equipment . . . or replacement jobs, Jal-Tread will assure you of these advantages:

Safe Footing—300 miniature squares per square foot—all of uniform height—provide maximum linear friction surface that protects you against lost-time accidents.

Easy Fabrication—The Jal-Tread straight line pattern simplifies welding, flanging, shearing, bending, punching, and drilling operations. Experience shows that Jal-Tread can be cold-formed on standard plate bending machines.

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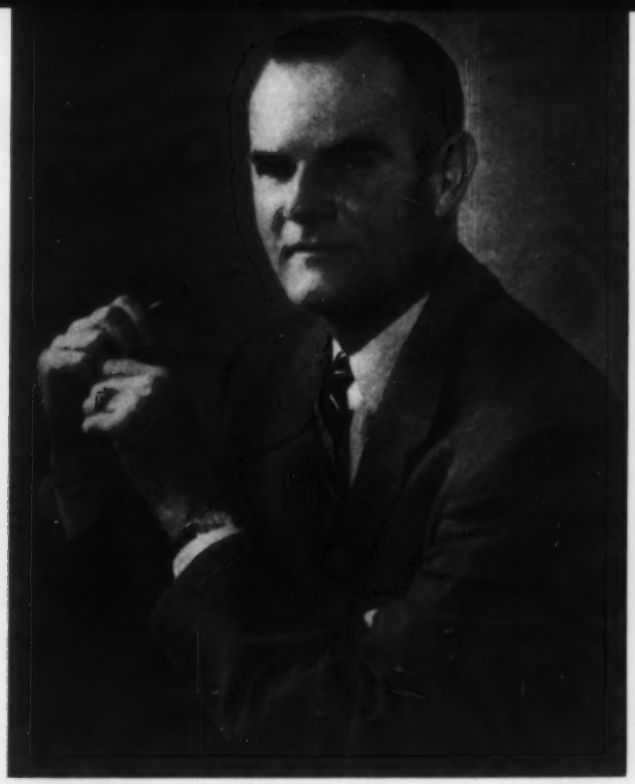
For safe, long-lasting flooring always specify J&L Jal-Tread . . . *it's available at leading distributors everywhere.*

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*



'Growth Is Our Duty,' Says Wheland's Street

"UNLESS WE continue to grow, we are not doing what we should for our employees, our community, our country."

Those words sum up the management philosophy of Gordon P. Street, youthful and energetic president of Wheland Co., one of the South's largest locally owned and managed heavy industries.

Dynamic—A company often is the lengthening shadow of the man at the top. In 1945 when Mr. Street became the president of the 90-year-old Chattanooga firm, it had one division and about 200 employees. Today, Wheland has three divisions and employs more than 2000 people. Its volume of business has increased 1000 per cent.

The manufacturing division, established in 1866, designs and produces equipment for the sawmill and rotary drilling industries; a modern production foundry, added in 1947, ships millions of castings to northern markets each year; the ordnance division, which dates back to 1951, produces 40, 75 and 90-mm cannons for Army ordnance and is a supplier to the aviation industry.

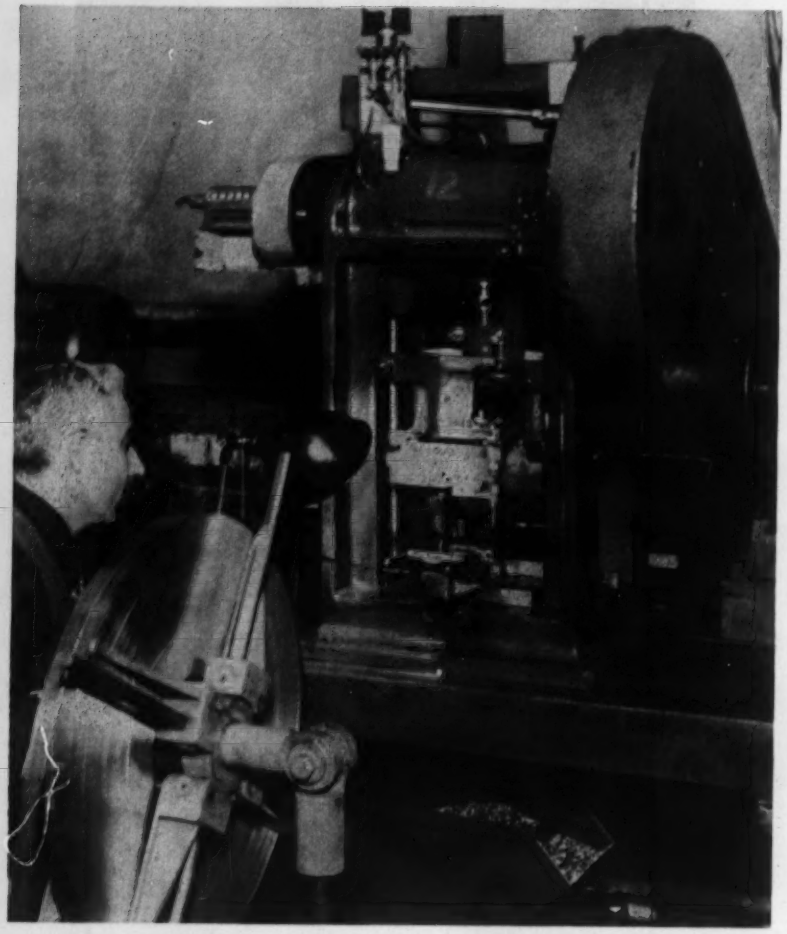
Diversification — When Mr. Street became president at the end of World War II, his first step was to look for product diversification. The modern gray iron production foundry, one of the largest independent operations in the country, was added. Wheland obtained and still holds large contracts for gray iron castings from the automotive industry. Only the efficiency of its equipment and productivity of its management and men enable Wheland, as a major supplier to northern industry, to overcome profitably the disadvantages of costly freight differentials.

In 1951, Mr. Street obtained a contract to produce cannons. A plant was constructed and equipped and the first cannon was completed less than nine months later. Today, this division has expanded its operations and is rapidly becoming an important supplier of subassemblies to the aviation industry.

Owner-Management — Wheland is closely owned. "We can be light on our feet," Mr. Street expains. "If our men find that new methods or equipment will improve efficiency, we move. There is no waiting around for days or weeks until we get an absentee owner's approval."

Mr. Street firmly believes in product diversification and delegation of authority. "I get good men who are not afraid to tackle difficult problems and give them the authority to run their divisions. When they want to try something new, I back them up."

Development—A policy of promotion from within and sponsorship of approved training courses have enabled the company to fill its constantly growing need for competent supervisors and managers.



New emphasis on mechanization helps . . .

Jewelry Sales Sparkle

COSTUME jewelry sales, now running at about $200 million a year, are bright enough to dazzle the manufacturers. Their business has almost doubled since 1947, and probably would be even better but for the intermittent base and plating metal shortages that have plagued it.

Inevitably, women are the big trinket plungers. But, the American male is becoming more of a peacock. Sales of men's costume jewelry are running 25 to 35 per cent ahead of last year's and may reach $30 million in 1955.

Import — Here's metalworking's annual stake in the picture: Brass mill products, 18,500 tons; zinc, 6000 tons; lead, 2000 tons; aluminum, 300 tons; chrome alloy steel, 450 tons; No. 305 stainless steel, 822 tons; and nickel, 1200 tons.

The industry employs about 50,000 workers. Some 800 manufacturing shops, about half the total, are in the state-line area from Providence, R. I., to Attleboro, Mass. Most of the remainder are in New York and New Jersey. About 80 per cent of dollar shipments come from the Providence district.

Merchandising—You have to be smarter than Solomon to stay alive in the costume jewelry business. Designers have to second-guess the fickle on styles and fashions months ahead of sale time. What the trade knows to be top-notch product design and style often flops, while an obvious "dog" is a scintillating success.

Design pirating is another problem, and price competition is acute, especially when a big seller begins to forge ahead. The big part of the industry's product is sold to wholesalers. Competition is even trickier at that level.

Self-Help—Despite their rivalry, makers have united to make progress in ironing out the production peaks and valleys that used to characterize the business. Though Christmas trade is still tops, promotion of special "days"—mother's, father's, birth and anniversary — is helping. Graduations, weddings and special events, fraternity pins, government insignia, emblematic and religious symbols all contribute.

The industry pays a high price for its style. Ever-changing demands make it impossible for makers to grow along conventional lines, and turn out millions of units of a given design or product. Labor costs are high, accounting for more than 50 per cent of the selling price.

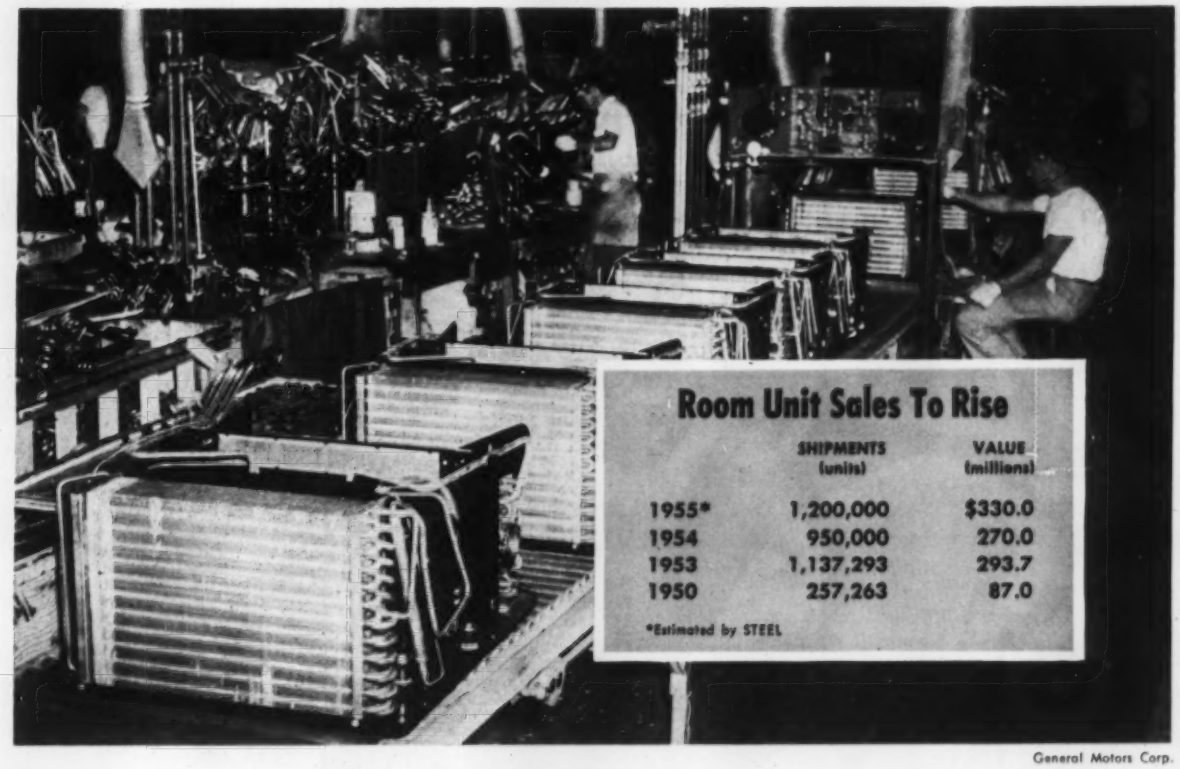
Outlook — Makers are being forced to cut these costs. Foreign competition, paying its labor 12 to 14 cents an hour in Japan, 31 to 39 cents in Germany, 22 to 48 cents in Austria, is giving the industry a lot of trouble. Higher tariffs aren't the complete answer. The industry is directing a lot of effort toward a better compromise between style and mechanization.

GM Designs New Train

General Motors Corp. is building a new lightweight low-cost passenger train. It will carry 400 passengers at speeds over 100 mph.

The train, ten coaches and a one-unit diesel locomotive, was designed after railroad officials asked for equipment that would: 1. Reduce equipment investment. 2. Reduce operating and maintenance costs. 3. Lower the center of gravity. 4. Increase average speed. 5. Improve riding comfort. 6. Reduce the passenger-carrying deficit (estimated at $700 million a year).

Harlow H. Curtice, GM president, says the corporation is interested primarily in promoting its diesels and has no intention of going into the railway passenger car business.



Room Unit Sales To Rise

	SHIPMENTS (units)	VALUE (millions)
1955*	1,200,000	$330.0
1954	950,000	270.0
1953	1,137,293	293.7
1950	257,263	87.0

*Estimated by STEEL

General Motors Corp.

Air Conditioning Sales Warm Up

AIR CONDITIONING, an up-and-down "infant" industry, is showing signs of maturity. The crisis came last year. New companies put pressure on the old ones. Selling methods and campaigns were based on a "hot" summer theme. Most of the U. S. had a mild summer.

Now the industry is pointing toward steady gains rather than "blue sky" estimates. Outlook for 1955: Slightly over 1-million units will be sold. In dollars, this means the volume at retail level for room units will increase from about $270 million in 1954 to $330 million this year, reports Carrier Corp. John Q. Public, homeowner, will still be the best customer. In 1954, he purchased 72 per cent of the 950,000 units produced.

Markets — Philco Corp. states that its two great markets for room air conditioners are multiple installations and the residential buyer. The multiple installation market is represented by office buildings, hotels, motels, industrial and institutional buildings. The residential market, says Philco, represents (on the basis of wired homes) practically an untapped market.

The Air Conditioning & Refrigeration Institute agrees and adds: "The best prospect for a room unit is the person who already owns one. Those who have them in one room will buy them for another."

Cutthroat — Intense competition has become a "way of life" with the air conditioning industry. Last year saw much price cutting. At the beginning of this year, the industry tried—with success—to get distributors and dealers to sell room air conditioners "year-round" rather than depend upon a one-shot summer selling season. This brought price cutting back into the picture. Dealers sold in volume during January and February, but "at the right price," to deplete stocks of 1954 models. One point was made: Air conditioners can be sold while snow is on the ground.

Sales program for the rest of this year will promote health, comfort, reduced cleaning and redecorating benefits.

Other Plans—An important effort is being made to increase sales at the dealer level. Salesmen are being trained to understand the benefits and features of the units they are handling.

Is air conditioning a luxury? Trane Co. states: "In residential air conditioning, it still is a luxury to some extent although it is rapidly coming out of this status, particularly in southern and central climates."

Future—A single unit, designed to heat as well as cool, has a bright future, according to U. S. Machine Division, Stewart Warner Corp. "We feel," says a company official, "that the single heating and cooling unit is tremendous. In fact, we're betting on it with large-scale research."

By 1960, central home units will have surpassed room units in dollar volume but about 2 million room air conditioners (1 million more than this year) will be sold for a retail total of about $600 million.

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FLAT-ROLLED STEEL produced by a specialist

The kids who roll down Oak Hill in a coaster wagon, and those of us who ride in the world's best automobiles, put a lot of faith in flat-rolled steel.

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Call on our 25 years of specialization in flat-rolled products. Our representative will be glad to discuss your particular needs at your request.

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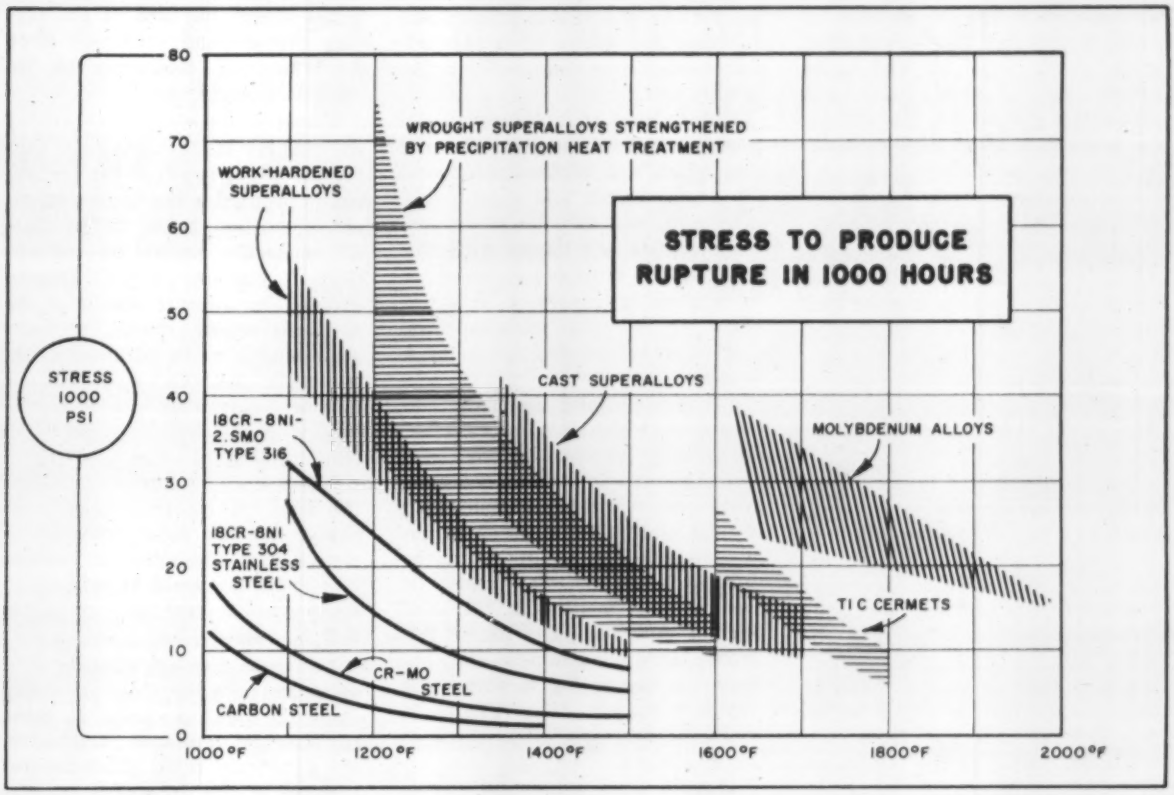

Strength of materials under stress above 1000° F

Wanted: Cheap but Tough Alloy for Auto Turbines

IF YOUR BOY should happen to be fooling around with his chemistry set and come up with an inexpensive alloy which has high strength at temperatures up to 2000° F, plus good ductility and resistance to thermal shock, have him call one of the auto companies and reverse the charges.

Research — Automakers are frankly up against a tough problem when it comes to turning the gas turbine from dream to reality. The fact that millions are being poured into research facilities is itself ample proof that they expect the problems of economical turbine production to be solved. But while those millions have served to progress turbine development at an unprecedented rate, the automotive turbine is a project of pioneering research with many obstacles.

To understand what automakers face, it first must be appreciated that automotive turbines present a problem fundamentally different from aircraft turbines which are well advanced in development. A jet plane merely better than anything else in the air is a good investment, and the cost is secondary.

Cost—With the automakers, cost assumes a primary significance. A real dandy turbine with a price tag of $20,000 would be fairly limited in its mass appeal. Even with a car cost of $5000, it would be tough to think of getting one into every garage. To stay in business, the automakers can only think in terms of a potential of one in every garage, and that's a turbine with a price tag within a hundred dollars or so of present engines.

That's where dreams leave off and plenty of hard work begins. While designers may come up with a turbine which solves operating problems like fuel economy, performance and cool exhaust temperatures (see STEEL, Mar. 29, 1954, p. 71), finding the materials and manufacturing methods which will give the desired cost becomes horsepower of a different color.

Matter of Metallurgy — Metallurgists are in the forefront of the development battle. Materials like nickel, cobalt, Inconel, Stellite, tungsten and molybdenum with molybdenum disilicide protection are being tried along with cermets in an effort to find the answer. But one thing that would make any metallurgist think about bird watching as a career is the fact that the conditions on which the answer depend are as flexible as a noodle needle.

To illustrate, let's say the de-

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signers come up with a turbine which needs an alloy requiring a strength of 50,000 psi at 1400 to 1600° F. In the wink of an eye, metallurgists come up with some answer like Oklahoma clay and columbium. Based on the design, the amount of columbium required is 1 lb per turbine.

Imponderables—How much will it cost? The price of Oklahoma clay is not likely to change appreciably, but the tag on columbium is likely to change a great deal when automakers start consuming 5 million lb annually. Or is it safe to assume that untold deposits of columbium are likely to be discovered in Boy Scout camps all over the country?

This is the sort of thing that no metallurgist ever ought to have to lose sleep about, but when you're developing a new material for something like immediate quantity consumption, a problem of sharply increased demand influencing the price becomes mighty important. It's also possible that supplies of columbium might be exhausted before the day crew gets back from lunch on Friday of the first week of turbine production.

Cost, Cost — Boiled down, this means that metallurgists must not only find materials to fill the bill based on existing costs, but closely anticipate what the costs are going to be in the future. That's only part of the nebulous character of the situation.

Presume that engineering finds that the cost of this new alloy, Oklahomium, is too high. Then metallurgists are advised to find a cheaper alloy, to which they may reply that unless the earth produces some new elements that may be difficult. Designers then enter the picture and it is suggested that the requirements of the material be changed. That means redesigning a turbine which the designers figured was somewhat better than man was capable of in the first place, and the impact on luncheon conversations can only be imagined.

Heat's On—This interrelationship of designer and metallurgist readily can be appreciated from a glance at the chart on page 73. The lower the requirements for the material, the more possible materials exist. But the turbine engineers know that the efficiency of the turbine increases as the temperature goes up. It's likely that even after the turbine is well into production, demands for alloys to withstand still higher temperatures will be coming along.

For the sake of illustration, let's presume that an alloy called sunium, which will withstand incredible temperatures and stresses, is developed, and the designers and metallurgists are happy with the result. Made from old asteroids, it is in plentiful supply, so material costs at existing interplanetary freight rates promise not to be a problem.

The Hitch—Enter the production engineers, which is a bit of wishful thinking because they have been in the picture right along. They explain that whacking sunium with Stellite dies makes more of an impression on the Stellite than the sunium. The material cannot be cast because melting of the sand surface puts the parts out of tolerance. Extruding sunium, they observe, is like trying to force iron out of a balloon. All of this could start the development job back at the beginning.

Despite this whimsical treatment, the subject is serious. Metallurgists, designers and production engineers are up against something like the sonic barrier. Alloys often are difficult and expensive to work when they have the required properties. What's more, the high rotational speeds required of the turbine will demand extremely close manufacturing tolerances to insure balance.

Added Problem—The nature of the turbine blade—extremely thin feather edges required for aerodynamic properties that insure efficient operation—holds differentials of expansion knotty to contemplate. Thermal shock, largely avoided in aircraft which cruise at fixed engine speeds, presents something more to conjure with in passenger cars which must continually be accelerating and decelerating, with consequent changes in temperature.

These are the sort of problems the auto turbine researchers face today. At this point probably no metallurgist, designer or production engineer would be willing to state when or how these problems will be solved.

Yet these men are meeting with optimism both the frustration and challenge that has marked all great fundamental research. Currently, the significant thing about the gas turbine is the incredibly accelerated development work of these men who only share a dream.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936,994	676,269
May	912,791†	621,318
June		623,732
July		543,540
August		523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,885,066

Week Ended	1955	1954
May 14	221,746	153,796
May 21	221,936	157,993
May 28	209,939	148,733
June 4	163,731	119,688
June 11	185,674†	139,312
June 18	185,000*	140,063

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Exhaust Notes

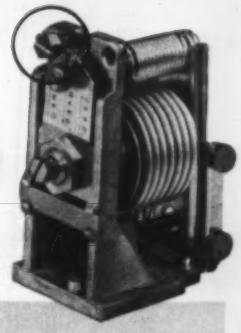
Ford Motor Co. will build its fourth engine plant at a site near Lima, O. Part of the recently announced $625 million expansion program, the plant will add to the existing facilities at Dearborn, Mich., and Cleveland.

Where the auto industry is going becomes clear in statements like that of Charles Seyffer, Ford Division assistant general sales manager. Mr. Seyffer says the number of two-car families will increase by 70 per cent in the next five years over the present eight per cent of American families owning more than one car. Car-owning families will increase from 66 per cent today to 74 per cent by 1960, he notes.

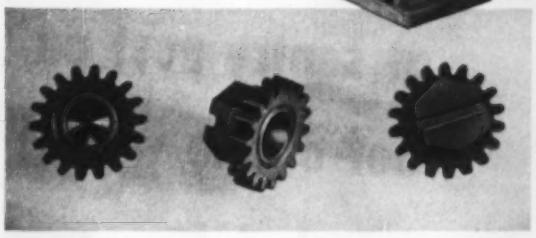
Chrysler 300's are doing all right in stock car racing this year, holding first, third and fourth places among NASCAR drivers. The car's batting average is 0.444 in competition, compared with 0.286 for its closest domestic competitor.

FOXBORO and RAPIDPRINT

with BRASS and

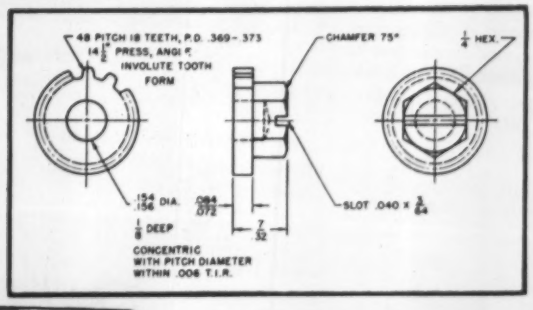


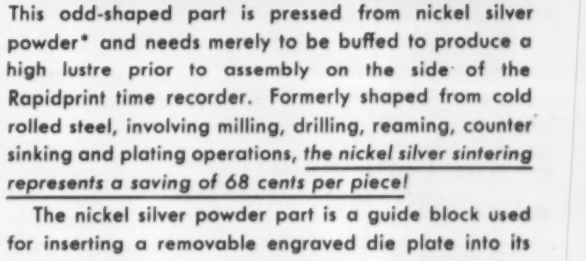
each save 68¢ per unit NICKEL SILVER POWDER PARTS



When production requirements increased for the Model 53 Consotrol Recorder, The Foxboro Company switched to a brass powder part for this pinion gear. The gear was formerly machined from pinion stock, involving (1) turning of the stock to provide the head, (2) drilling the hole, (3) cutting off, (4) milling the screw driver slot, and (5) wire brushing to remove burrs. *Total cost was 74 cents per gear!* As a brass sintering the gear is now pressed to finished shape and size in one operation* and *the cost is 5.8 cents per gear!* In addition to saving more than 68 cents, production from brass powder permits the addition of flats to the pinion heads.

*Presmet Corporation, Worcester, Mass.

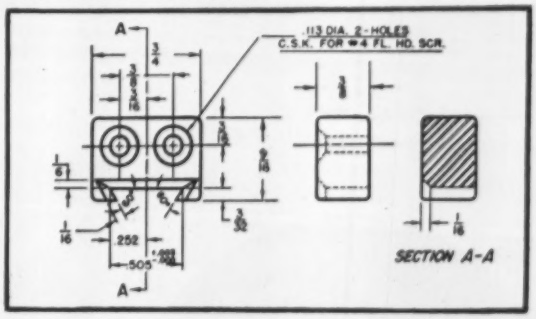


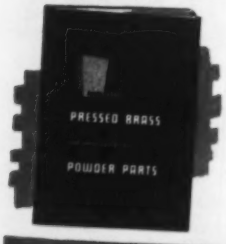


This odd-shaped part is pressed from nickel silver powder* and needs merely to be buffed to produce a high lustre prior to assembly on the side of the Rapidprint time recorder. Formerly shaped from cold rolled steel, involving milling, drilling, reaming, counter sinking and plating operations, *the nickel silver sintering represents a saving of 68 cents per piece!*

The nickel silver powder part is a guide block used for inserting a removable engraved die plate into its proper position on the Rapidprint time recording machine.

* Merriman Bros. Inc., Boston, Mass.





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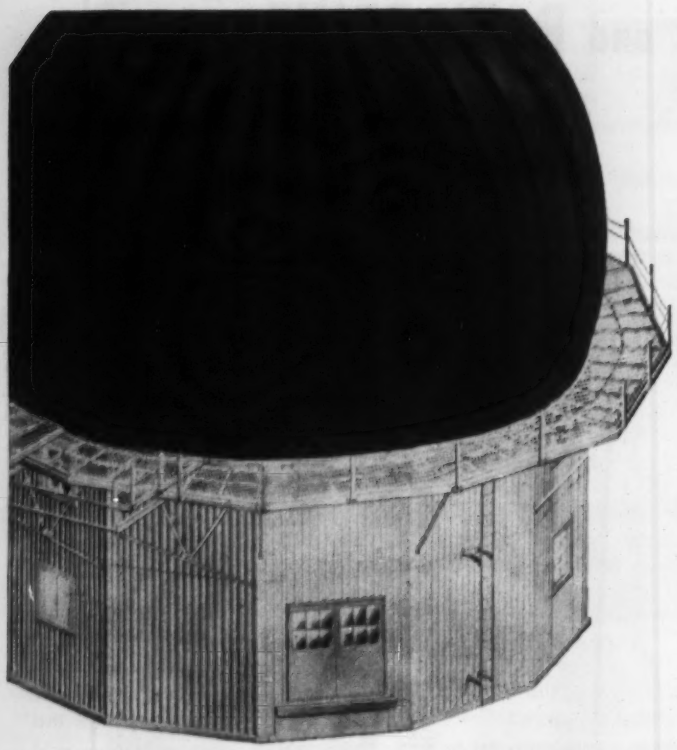
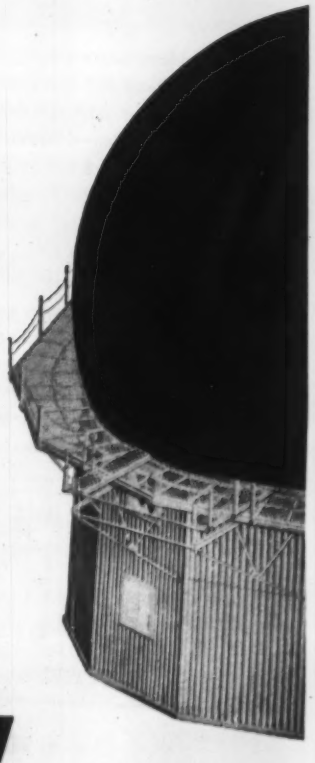
HORSE HEAD PRODUCTS



ON GUARD above the Arctic Circle, Air Force radar station features flexible neoprene-and-fiberglass dome which pulsates to dislodge ice and snow.

Radar dome shrugs off 100-mph gales at sentry post on roof of the world!



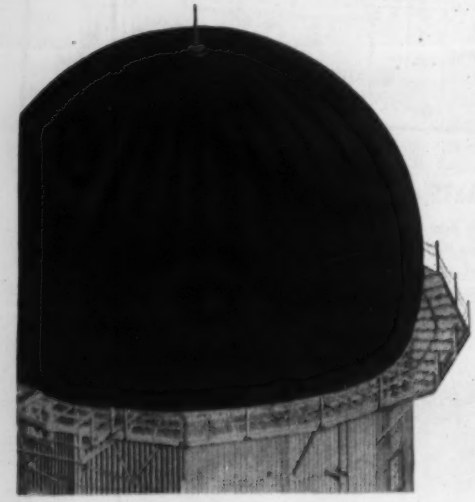
RB&W bolts hold tight on critical fastening job

You'll never read a headline about RB&W bolts and nuts in U. S. Air Force radar domes strung across the top of the world. But the men who build the odd-shaped structures—Dresser-Ideco Co. of Columbus, O.—know that their ability to withstand the cruelest weather on earth stems largely from these work-a-day fasteners.

C. Daniell Byrd, Dresser-Ideco's sales promotion manager, puts it in these words:

"Keynote of our planning is rugged construction. RB&W bolts offer superior size and dimensional stability. Since the parts *must* fit, RB&W's consistent product uniformity adds an essential 'plus' to the strength and performance of these bolts."

Maybe your product doesn't have to withstand 100-mph Arctic blasts. Wherever it's used, however, it will do a better job for a longer time if you put it together with RB&W fasteners. We'll be glad to show you how. RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N. Y. 4.12



RB&W

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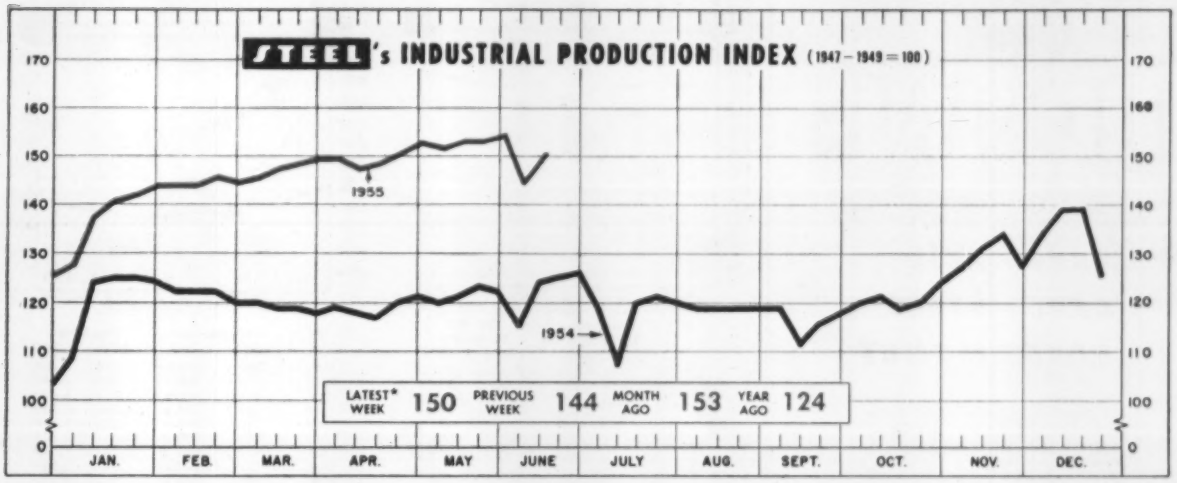

*Week ended June 11. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

More Workers, More Spending, More Business

LOOK FOR business to stay good for the rest of the year.

The steel industry is going at close to full tilt with not much of a slowdown in prospect. Autos will start cutting back for model change-over, but will be back with a rush in the fourth quarter. Construction sets a new record practically every week. Personal income is high, and it's burning a hole in consumers' pockets. No fireman is on the scene; he's out spending, too.

Record Income—Rising employment is a good indicator of what's happening. It went up almost a million in May, the second straight month of that kind of improvement. Unemployment dropped 800,000 during the month.

So personal income should show another jump. It's already at a record annual rate of $293.5 billion over the first four months, 3 per cent above the same months of last year.

Factories Hire—One of the most significant pointers to business confidence is a rise in factory employment, which usually declines at this time of year. It's only the second time in the postwar period that the factory job total has expanded in May. The previous gain, in 1950, was due to settlement of an auto strike, plus gathering war clouds in Korea.

Metalworking was a potent force in the May employment market, accounting for over two-thirds of the 60,000 gain. Primary metals took on 21,000 workers; fabricated metal products, 8000—record April to May rises for both industries.

Additions—Machinery added another 8000 for the fourth straight month of significant gains. Transportation employment was unchanged as auto gains were offset by dips in aircraft and shipbuilding.

Reflecting record construction, that industry's employment rose 141,000, an unusually large gain. Building now employs 2.5 million, about the same as last year, but

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,330[1]	2,286	1,725
Electric Power Distributed (million kw-hr)	9,850[1]	9,537	8,658
Bitum. Coal Output (1000 tons)	8,730	9,330	6,460
Petroleum Production (daily avg—1000 bbl)	6,650[1]	6,592	6,495
Construction Volume (*ENR*—millions)	$378.3	$324.1	$325.5
Automobile, Truck Output (*Ward's*—units)	185,674[1]	163,731	139,312
TRADE			
Freight Car Loadings (1000 cars)	770[1]	714	698
Business Failures (Dun & Bradstreet, no.)	210[1]	203	206
Currency in Circulation (millions)[3]	$30,059	$29,961	$29,873
Dept. Stores Sales (changes from year ago)[3]	+5%	+10%	−18%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,586	$16,738	$18,033
Federal Gross Debt (billions)	$277.4	$277.5	$273.3
Bond Volume, NYSE (millions)	$25.7	$16.5	$16.1
Stocks Sales, NYSE (thousands of shares)	14,512	9,711	9,640
Loans and Investments (billions)[4]	$84.2	$84.3	$80.5
U. S. Govt. Obligations Held (billions)[4]	$33.0	$33.3	$33.2
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.75
STEEL's Nonferrous Metal Price Index[6]	237.4	237.1	215.0
All Commodities[7]	110.3	110.2	110.5
Commodities Other than Farm & Foods[7]	115.6	115.6	114.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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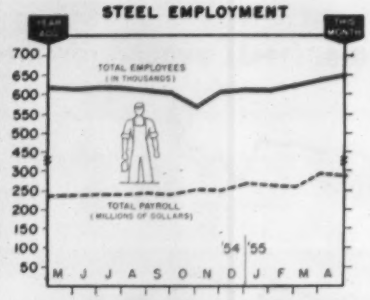
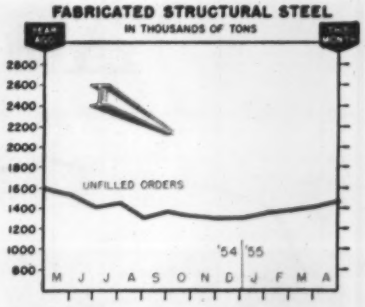
THE BUSINESS TREND



	Employment in Thousands 1955	1954	Payroll In Millions 1955	1954
Jan.	605	645	$258.8	$251.3
Feb.	616	636	255.1	236.6
Mar.	630	621	288.2	249.7
Apr.	643	609	282.0	232.6
May	...	606	.....	234.4
June	...	609	.....	236.4
July	...	608	.....	232.8
Aug.	...	601	.....	238.8
Sept.	...	597	.....	234.6
Oct.	...	596	.....	244.7
Nov.	...	599	.....	247.7
Dec.	...	605	.....	262.2

American Iron & Steel Institute.



	Shipments 1955	1954	Backlogs 1955	1954
Jan.	225.8	245.6	1,346	1,686
Feb.	213.4	253.1	1,360	1,697
Mar.	227.8	285.4	1,392	1,645
Apr.	239.7	293.5	1,444	1,566
May	....	253.9	....	1,490
June	....	290.3	....	1,391
July	....	265.2	....	1,429
Aug.	....	272.5	....	1,270
Sept.	....	265.4	....	1,329
Oct.	....	258.4	....	1,294
Nov.	....	228.7	....	1,280
Dec.	....	223.5	....	1,281
Total	....	3,135.5		

American Institute of Steel Construction.

Charts Copyrighted, 1955, STEEL.

85,000 under the 1951 record for the month.

Bigger Paychecks—The factory workweek is up to the May, 1953, peak of 40.7 hours. Longest May workweeks in ten years are reported in transportation equipment (42.7 hours) and in primary metals (41.6 hours).

The longer workweek and some increases in hourly pay boosted average weekly earnings to $76.11, an all-time peak for May. That high level of earnings is likely to go up further when additional new labor contracts take effect.

Laundry Appliances Clean Up . . .

The broadness of business gains is encouraging. Last year, home laundry appliance sales topped the $1-billion mark for the first time. It looks like this year will be even bigger. Unit sales should near 5 million, compared with about 4.5 million last year.

Those appliances are entering their usual seasonal letdown, but it's coming after the biggest quarter in the industry's history, reports the American Home Laundry Manufacturers' Association. First-quarter factory sales were over 1.4 million, an annual rate of close to 6 million.

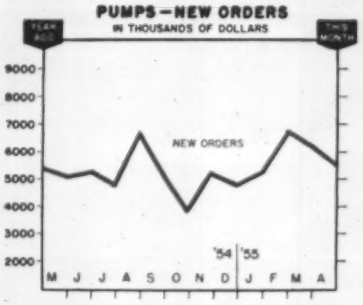
The seasonal slump usually lasts through July and will make a dent in that promising annual rate. It showed up in April, with sales dipping 20 per cent under March, though still 29 per cent above April of last year. Helping make that 29 per cent were dryers, which almost doubled sales of a year ago.

Steel kitchen cabinets have a firm foothold in modern homes. Sales went up 20 per cent in the first quarter, and the uptrend continues in the present period, reports the Steel Kitchen Cabinet Manufacturers Association.

Auto Sales at Top Speed . . .

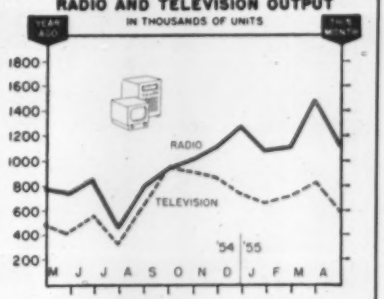
In the auto industry, dealers' new car stocks are down to a 25-day supply, following all-time record sales of 30,000 a day in the last ten days of May, says *Ward's Automotive Reports.* Unitwise, though, inventories are at a new high of 705,000.

Still, some makers don't seem able to keep up with demand. *Ward's* says: "Chevrolet 1955 dealer sales, virtually tied with Ford at the end of April, pulled ahead by 4.5 per cent at the close of May, blistering Ford factory production apparently being unable to



	1955	1954	1953
Jan.	5,220	4,057	5,752
Feb.	6,709	4,272	6,521
Mar.	6,161	5,093	8,255
Apr.	5,447	5,319	7,758
May	....	5,007	4,629
June	....	5,176	5,690
July	....	4,733	5,533
Aug.	....	6,706	4,886
Sept.	....	5,050	4,845
Oct.	....	3,828	5,097
Nov.	....	5,224	4,634
Dec.	....	4,787	4,645
Total	....	59,252	68,245

Hydraulic Institute.



	Radio		Television	
	1955	1954	1955	1954
Jan.	1,068	872	655	421
Feb.	1,090	769	703	427
Mar.	1,482	940	831	600
Apr.	1,100	745	583	458
May	....	722	...	396
June	....	838	...	544
July	....	438	...	307
Aug.	....	785	...	633
Sept.	....	932	...	948
Oct.	....	998	...	921
Nov.	....	1,099	...	859
Dec.	....	1,262	...	833
Total	....	10,400	...	7,347

Radio-Electronics-Television Mfrs. Assn.

maintain dealer stocks at levels needed to meet the challenge."

From here on out, the inventory trend should be downward. Most producers are in the final two or three months of the 1955 model run, and an orderly dealer clean-up is a must to pave the way for mostly facelifted 1956 models.

Traffic Piles Up . . .

Another segment of the transportation industry is continuing to pick up. Estimated net income of 126 Class I railroads in April was $67 million, compared with $40 million in that month last year. For the first four months, income is almost double that of a year ago, $243 million vs. $132 million.

Virtually all the increase in the first four months was due to lower operating costs, down 3.3 per cent. Total revenues went up only 2.2 per cent, according to Association of American Railroads.

Intercity truck freight set a first-quarter record of over 60.4 million tons. It was a gain of 12.2 per cent over the same period in 1954. Big gains were haulage of autos, up 38.2 per cent, and building materials, up 33.4 per cent, says American Trucking Associations Inc.

Building Up 20 Per Cent . . .

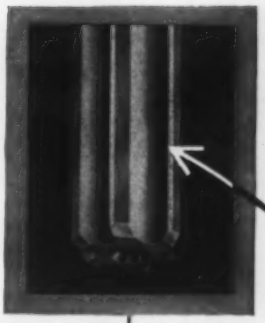
Construction is building more records and by impressive margins. Contract awards for heavy construction in May topped last year's record for the month by 20 per cent. It's the third straight month of new records.

The May total of $1,727 million averages out to $432 million per week. That's the largest weekly volume for any month in history except for certain periods in 1950 and 1952 when huge Atomic Energy Commission contracts were let, according to *Engineering News-Record.*

The record May total pushed the five-month total to $7.5 billion, 14 per cent above the old record in 1953 and more than 40 per cent over the same period of 1954.

June is starting out to be another month of the same. The rapid rate of awards in the first two weeks of the month pushed totals for the year to date 21.2 per cent above the old record.

Private work is setting the pace, accounting for 64 per cent of all heavy construction awards. That compares with previous highs of 59 per cent in 1953 and 1954 and 60 per cent in 1951 during the defense industrial expansion.



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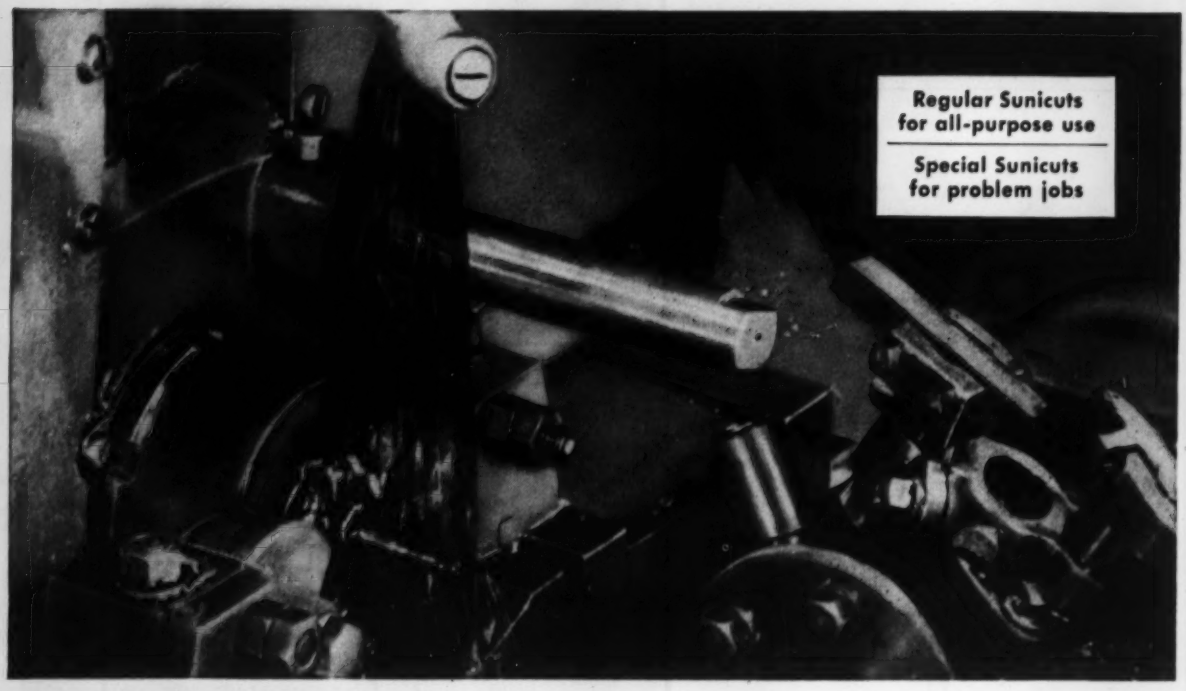

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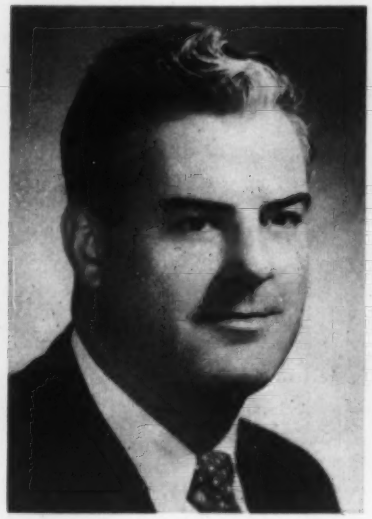


ROBERT G. EMRICK
. . . Ettco Tool president

N. J. MacDONALD
. . . Thomas & Betts president

CHARLES B. LANSING JR.
. . . Ferry Cap & Set Screw president

Robert G. Emrick, executive vice president, was elected president of **Ettco Tool Co. Inc.,** Brooklyn, N. Y. He succeeds his brother, **Melvin H. Emrick,** now chairman of the board.

Frank U. Hayes, a vice president of **Bullard Co.,** Bridgeport, Conn., was made assistant general manager. He has served as sales manager since 1947.

Donald E. Wingate was appointed chief engineer, **Ipsen Industries Inc.,** Rockford, Ill. He was with Surface Combustion Corp.

Robert C. Andrews was made sales manager for **Clark Equipment Co.'s** axle division, Buchanan, Mich. For the last 15 years he was with Vickers Inc.

R. W. Bingham was made manager of terne and roofing sales, **Follansbee Steel Corp.,** Follansbee, W. Va. He was vice president of Albert P. Hill Co. Inc., Follansbee's advertising agency.

Karl A. Roesch was named general manager of **White Motor Co.'s** Autocar Division, Exton, Pa. He succeeds **Edward F. Coogan,** retired.

Ben H. Carlisle was named manager of the recently established new products division of **Clark Controller Co.,** Cleveland.

Thomas & Betts Co., Elizabeth, N. J., elected **N. J. MacDonald** president; **Robert McK. Thomas Jr.,** general vice president; **Edward C. Hewitt,** vice president-sales; **Marcel F. Tetaz,** assistant treasurer; and **C. E. Koss,** assistant secretary.

Frank W. Rickard was elected president and general manager, **Mechanics Universal Joint Division,** Rockford, Ill., Borg-Warner Corp. He was director of manufacturing services for the corporation. **Chester E. Palmer,** formerly division vice president and assistant general manager, was elected executive vice president. Mr. Rickard succeeds **Arch A. Warner,** who retired earlier in May. The divisional presidency was held temporarily by **L. G. Porter,** administrative vice president of Borg-Warner.

Harry F. Baker was elected vice president of **Paslode Co.,** Chicago. He was general manager of the company, a subsidiary of Signode Steel Strapping Co.

Warren W. Marotz was appointed purchasing agent of **Griffin Wheel Co.,** Chicago. He succeeds the late **Lloyd J. Scott.**

Francis J. Brickle was made district manager in charge of P&H crane and hoist sales in the New York office of **Harnischfeger Corp.**

Charles B. Lansing Jr. was elected president and treasurer of **Ferry Cap & Set Screw Co.,** Cleveland. **W. H. North** was elected vice president and secretary. **H. D. North,** former president, was elected chairman of the board.

Pitney-Bowes Inc., Stamford, Conn., elected **William F. Bernart,** executive vice president, to the new office of senior vice president in charge of a new engineering division. **John H. Pratt Jr.** was elected administrative vice president, also a new office. **Frederick T. Allen,** production manager, succeeds Mr. Pratt as vice president-manufacturing.

Frank F. Elliott, senior vice president in charge of sales at **Crane Co.,** Chicago, was elected president and chief executive officer. He succeeds **John L. Holloway,** who resigned because of ill health, but will continue as a consultant.

John A. Gilroy joined **Harnischfeger Corp.,** Milwaukee, as plant engineer. He was chief engineer for Wyman-Gordon Co. He succeeds **William Hitzelberger,** retired.

Robert P. Gwinn was elected president, **Sunbeam Corp.,** Chicago, to succeed **B. A. Graham,** who was elevated to vice chairman and granted a leave of absence for reasons of health. Mr. Gwinn also

ROBERT F. AMES
. . . U. S. Steel New York p. a.

PAUL W. NORRIS
. . . v. p. of Denison Engineering

MILTON E. BERGLUND
. . . Torrington Co.'s exec. v. p.

was named general manager. He was vice president and sales manager, electric appliance division.

Robert F. Ames, office manager at Pittsburgh for **United States Steel Corp.'s** purchasing division, was appointed New York purchasing representative.

Allan R. Rowen, former sales manager, Sintering Machinery Corp., joined **McDowell Co. Inc.,** Cleveland, as a sales engineer and head of the lightweight aggregate section of its new Dwight-Lloyd Division.

Arthur E. Darcy was made manager, machine methods department, coated abrasives division, **Carborundum Co.,** Niagara Falls, N. Y.

Fred H. Johnson, formerly assistant to the vice president of steel manufacturing at **Inland Steel Co.,** Chicago, was appointed engineering consultant to the vice president in charge of planning and administration. Changes in Indiana Harbor Works' engineering department, East Chicago, Ind., are: **S. W. Benson II,** made assistant chief engineer in charge of flat and shape products engineering; **T. W. Myhre,** assistant chief engineer in charge of primary products, operating services and services engineering; and **J. M. Howard,** who continues as chief engineer, and will be in charge of mechanical, electrical, project and control engineering.

Paul W. Norris was promoted to vice president and director of sales at **Denison Engineering Co.,** Columbus, O. He has been director of sales since last February.

John K. Light fills the new post of assistant sales manager at **Arcos Corp.,** Philadelphia. He was New England district sales manager and is replaced by **James A. Brickett Jr.,** who has headquarters in Boston.

Roy Barbier was appointed Detroit district sales manager, **Alloy Metal Wire Division,** H. K. Porter Company Inc. He will handle sales of both Alloy Metal Wire and Riverside Metal Divisions.

Marion Black was made plant manager, **Baldwin Mfg. Co.,** Toledo, O., and **Larry Galvin** was named to a new sales post to handle local sales.

N. R. Hettman was made assistant sales manager of **American Steel Band Co.,** Pittsburgh. He was Pittsburgh district manager.

Richard E. Pfunder was made Pittsburgh district manager for the machine tool division of **Warner & Swasey Co.** He is replaced as district manager in Atlanta by **Leonard J. Fox.**

Frank M. Mansfield III was appointed manager of product planning and marketing research for **Carboloy Department,** Detroit, General Electric Co.

Milton E. Berglund was elected executive vice president, **Torrington Co.,** Torrington, Conn. He was vice president of manufacturing. **Theophil H. Mueller,** assistant to the president, was elected a director.

Metal & Thermit Corp. made **Henry Mahlstedt** sales manager of its electroplating and coatings sales department which now operates as the **United Chromium Division,** New York. **Donald R. Meserve** becomes assistant manager-sales.

Royden C. Presley was made Buffalo district manager, **Allegheny Ludlum Steel Corp.,** to replace **Henry N. Anthony,** now district manager in Philadelphia. Mr. Anthony replaces **F. Price Norris Jr.,** recently made director of sales, stainless and specialty steels, Pittsburgh. **Walton P. McCord** was made district manager at Birmingham to replace Mr. Presley.

John P. Cochran joined **Columbia Iron & Metal Co.,** Cleveland, as a trader in iron and steel scrap. He was senior buyer of raw materials for steel production at Ford Motor Co.

L. W. Smith was appointed manager, distributor sales division, **Leece-Neville Co.,** Cleveland. He was manager of communications with Radio Corp. of America.

David O. Merrill was made sales manager at New York for the container division of **Jones & Laugh-**

Another Transfer-matic by Cross

Mills, Drills, Bores, Taps, 2 and 4 Barrel Intake Manifolds

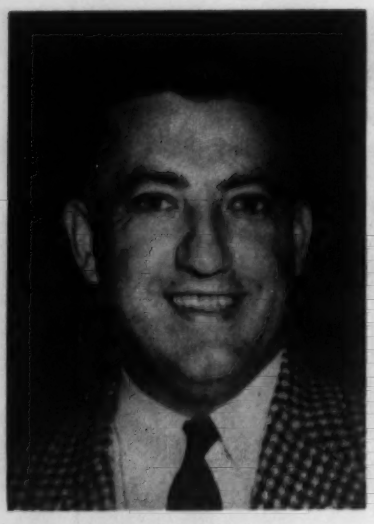
- ★ Rough and finish mills carburetor pad; mills choke pad (4 barrel only); bores carburetor port holes; drills and chamfers all holes (except 3 holes in water outlet pad); and taps all holes.
- ★ 140 pieces per hour at 100% efficiency.
- ★ Initial part location from port openings.
- ★ Push-button changeover from 2 to 4 barrel carburetor.
- ★ 13 stations; 1 loading, 11 working, 1 unloading.
- ★ Lift-and-carry type transfer mechanism.
- ★ Pre-set tooling throughout.
- ★ Other features: construction to J.I.C. standards; complete interchangeability of all standard and special parts for easy maintenance; hardened and ground ways; drag chain type chip conveyor.

Established 1898

THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS



KENNETH A. HONROTH
. . . heads Freeway Washer & Stamping

ALBERT J. SMITH
. . . sales mgr. at McKay electrode div.

A. J. MORGAN
. . . a sales mgr. at Aetna-Standard Eng.

lin Steel Corp. He succeeds K. M. Lyons, retired.

Freeway Washer & Stamping Co., Cleveland, elected Kenneth A. Honroth president and Walter S. Sutowski secretary-treasurer. Mr. Honroth succeeds Clifford A. Rooke, resigned.

Robert E. Braggins was elected executive vice president and general manager, Erie Enameling Co., Erie, Pa. Wesley L. Reynolds was named plant manager in charge of all plant operations. Herbert R. Spencer Jr. was made secretary treasurer.

Maxwell Co., Bedford, O., appointed M. C. Hutto general manager. Elmer J. Kalat was made chief engineer.

James W. Grimm is Philadelphia regional manager for the replacement sales department of AC Spark Plug Division, General Motors Corp.

Albert J. Smith was made sales manager, electrode division, McKay Co., Pittsburgh. He was assistant sales manager.

John W. Swengel was made assistant works manager, R-P&C Valve Division, American Chain & Cable Co., Reading, Pa. He was foundry superintendent.

Joseph B. Rice was elected vice president-manufacturing, Electro-Data Corp., Pasadena, Calif.

W. J. Millett was made assistant vice president-manufacturing of Worthington Corp.'s air conditioning and refrigeration division. He has offices in Harrison, N. J.

Inland Steel Co., Chicago, made Thomas A. Foss assistant superintendent, rail accessories division, in charge of the spike division; and William A. Greene, assistant superintendent, Plant 2 mills, in charge of the 28-in. mill, 28-in. mill warehouse and rail finishing.

A. J. Morgan was appointed sales manager of sheet and strip equipment for Aetna-Standard Engineering Co., Pittsburgh.

Walter S. Baker was made Hartford, Conn., district sales manager, Universal-Cyclops Steel Corp. He replaces F. F. Harter, who continues as special representative.

Charles W. Mote was made manager of the forge plant of Dodge Division, Chrysler Corp., Detroit.

H. Stanley Thompson was made general superintendent of the south side plant in Pittsburgh for A. M. Byers Co.

Richard J. Stamberger was named assistant district sales manager at New York for Youngstown Sheet & Tube Co.

International Resistance Co., Philadelphia, made Frank Van Gilder assistant sales manager, merchandise division.

OBITUARIES . . .

Abraham Weinstein, 73, vice president, Calumet Iron & Supply Co., East Chicago, Ind., died June 7.

Lloyd J. Scott, 66, general purchasing agent, Griffin Wheel Co., Chicago, died June 5.

Frank F. Fiend, 75, founder and president, Modern Heat & Forging Co. Inc., Buffalo, died June 3.

K. R. Vogel, 57, secretary, Crucible Steel Co. of America, Pittsburgh, died June 7.

Raleigh J. McCormick, 75, chairman, Langley Steel Corp., San Diego, Calif., died June 1.

Harrison D. Worthington, 61, assistant manager of U. S. Steel Corp.'s American Steel & Wire Division in the Chicago district, died June 5.

Bernard C. O'Brien, 66, president, Bury Compressor Co., Erie, Pa., died May 27.

Chester J. Walter, 50, executive vice president, Buffalo Pattern Corp., Buffalo, died May 30.

Mill circles and angles in one set-up with

tri-D
MILLING HEAD
KEARNEY & TRECKER
MILWAUKEE

Pat. No. 2286821
Other Pat. Pend.

Booth No. 508

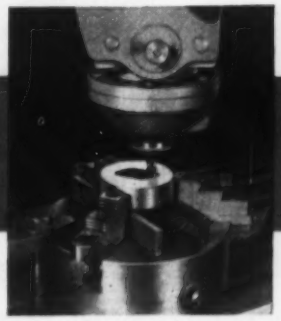
Here, operator uses TRI-D Milling Head to perform a variety of intricate milling operations on a workpiece—straight, circular, angular, radii—all in a single set-up. Angular adjustment of cutter in vertical plane is an exclusive feature of TRI-D.

For tool rooms, die shops or production milling — — do it faster, easier with new TRI-D attachment

Kearney & Trecker's new TRI-D Milling Head — featuring rotary, lateral and angular adjustment in vertical plane — is ideally suited for rough and finish milling of various geometric shapes — straight lines, radii, circles, angles — all in a single set-up. It can be easily mounted on almost all horizontal and some vertical milling machines . . . *regardless of make.*

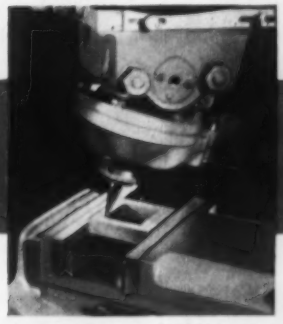
Illustrated here are some of the intricate operations the TRI-D performs.

Learn what the TRI-D can do for you — how different it is from all other types of milling heads in use today. For "proof-positive" demonstration, see your Kearney & Trecker representative. Contact him today, or write Kearney & Trecker Corporation, 6784 W. National Ave., Milwaukee 14, Wis.



Die (left) and punch (right) are rough and finish milled in a single set-up, using all three basic movements of the TRI-D

and milling machine. Prescribed feeds and adjustment of TRI-D is all that's required to finish both workpieces.



Angular setting of TRI-D, with an ordinary end-mill ground to a specific angle, is used to mill the "square corners."

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

Builders of Precision and Production Machine Tools Since 1898

For more information on Kearney & Trecker's new TRI-D Milling Head, write for catalog No. TD-10.

YOU CAN'T BUILD TOMORROW'S PROFITS WITH YESTERDAY'S MACHINES

Modernize NOW with P&J

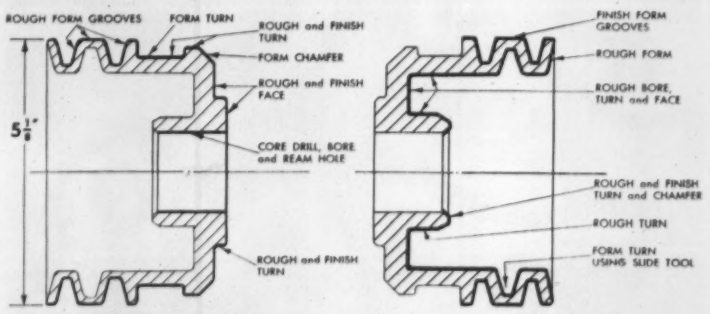
JOB FACTS:

PART . . . . Pulley

SIZE . . . . . Approx. 3¾" long x 5¼" Diam. (Rough Casting)

MATERIAL . . Cast Iron

OPERATIONS All surfaces rough and finish machined. Hole reamed. Twenty-five separate cuts in all.



SURFACES MACHINED ARE INDICATED BY HEAVY LINES

A very real problem that faced a large engine manufacturer was solved by installing MODERN EQUIPMENT. A Potter & Johnston Automatic provided the speed, power and versatility to meet their demands for fast, accurate, low-cost production. Tooling engineered by P&J Specialists took full advantage of combined cuts and faster-cutting carbide tools to reduce machining time to a minimum.

No, you can't handle today's . . . and tomorrow's . . . job requirements on yesterday's machines. Give yourself an extra margin of profit; modernize with Potter & Johnston Automatics . . . and with P&J Tooling. Start today . . . SEND FOR YOUR COPY OF BULLETIN NO. 154 — "34 Practical Production Ideas."

MODERNIZE with POTTER & JOHNSTON REPLACE FOR PROFIT

LET P & J SHOW *You* THE WAY

. . . SEE US AT BOOTH 1219

POTTER & JOHNSTON CO.

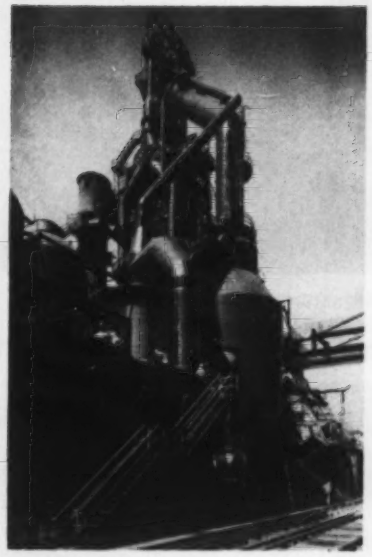
PAWTUCKET, RHODE ISLAND

SUBSIDIARY OF

PRATT & WHITNEY

DIVISION NILES-BEMENT-POND COMPANY

PRECISION PRODUCTION TOOLING P&J **FOR MORE THAN FIFTY YEARS**



Great Lakes furnace . . .

Breaks 30-ft "Ceiling"

IRON is flowing from Great Lakes Steel Corp.'s new blast furnace—the world's largest.

Pouring of first iron was as momentous as the breaking of the sound barrier. Furnace "A" on Zug Island in River Rouge, Mich., is the first to have a hearth size of 30 ft—width predicted 15 years ago by Wm. A. Haven, former president of Eastern States Blast Furnace & Coke Oven Association. In the last decade, several 28-ft furnaces and a few 29-ft furnaces have been built.

Koppers' Design—Designed and erected for Great Lakes Steel Corp., division of National Steel Corp., Pittsburgh, by the Freyn department of Koppers Co. Inc., that city, blast furnace "A" has a hearth diameter of 30 ft 3 in.

Production at full-rated capacity is 50,000 tons per month. Engineers predict that as operating experience develops the furnace may average over 60,000 tons per month. The record is 55,835 tons. W. H. Collison is superintendent of blast furnaces and coke plant at River Rouge.

The new furnace rises 252 ft above the yard level. It rests on concrete pads 71 ft in diameter and 16 ft thick. They, in turn, rest upon steel piling extending 84 ft into the ground to bed rock. Firebricks of various dimensions (equivalent to 2,844,694 of the standard 9-in.-thick size) were used to line the furnace, its three hot-blast stoves and other auxiliaries. When fully charged, the furnace weighs 12,813 tons. Its interior volume is 64,425 cu ft.

Furnace "A" replaces a 20,000-ton-per-month furnace that was dismantled last year after 19 years of service. It restores to four the number of blast furnaces at the Zug Island plant, which produces iron for the steelmaking operations in the main plant at Ecorse, Mich. Rated capacity of the four furnaces is 2,050,000 tons per year.

Blast Furnace Diet

GREAT LAKES Steel Corp.'s furnace "A" consumes a tremendous amount of raw materials. At 100 per cent of rated operating capacity, some of its approximate daily requirements in net tons are:

Ore	3,200
Coke	1,300
Limestone	550
Water (for cooling)	55,000
Air (for blast)	5,000

The additional supply of iron provided by the new furnace, plus the enlargement and modernization of other facilities in progress at the main plant, will enable Great Lakes to increase its output of cold-rolled sheet 600,000 tons annually. The program is scheduled for completion later this year. It's part of the over-all 1954-55 program of expansion and improvement of National Steel Corp. Ernest T. Weir, chairman, has stated it will require an expenditure of more than $120 million.

Ray-O-Vac Buys Reading Firm

Ray-O-Vac Co., Madison, Wis., purchased Willson Products Inc., Reading, Pa., manufacturer of industrial protective devices and sun glasses. J. Clyde Ryan, executive vice president of Ray-O-Vac, was elected president and general manager of Willson Products Inc. Thomas A. Willson was elected chairman of the board; Thomas A. Willson Jr., vice president in charge of production; W. C. Weeks, vice president in charge of sales; F. Saul Stump, secretary-treasurer.

Cleveland Firm Opens Branch

Electric Controller & Mfg. Co., Cleveland, established an office at 530 El Camino Real, San Carlos, Calif. J. L. King is in charge of the office.

Vanadium Corp. Opens Office

Vanadium Corp. of America opened purchasing headquarters at its executive offices, 420 Lexington Ave., New York 17, N. Y. Now at this address are Frederic W. Thomas, director of purchases; A. G. Paugh, newly appointed assistant director of purchases; and their staff.

Equipment Maker Adds Line

Standard Steel Corp., Vernon, Calif., has started manufacturing cement and aggregate batching equipment.

Mill Equipment on Order

Over half the production equipment required for initial operations at Kaiser Aluminum & Chemical Corp.'s foil and sheet mill has been ordered. On the Ohio river, the plant is near Ravenswood, W. Va. (STEEL, Apr. 25, p. 54). Contracting heavy machinery manufacturers are fabricating the major units. By mid-1956, this equipment and auxiliaries will be operating. The ultimate rated capacity of the plant will be 250 million lb a year.

The contracting companies and the equipment they are building are: Lewis Machinery Division, Blaw-Knox Co., Pittsburgh, 4-high rolling mill to produce foil; Continental Foundry & Machine Co., Pittsburgh, 4-high rolling mill to produce sheet; Wean Equipment Corp., Cleveland, flying shear line. Stamco Inc., New Bremen, O.; Intra-Roto Machine Co., Richmond, Va.; Farrel-Birmingham Co., Ansonia, Conn., and Bagley-Sewall Corp., Watertown, N. Y., will make uncoiling, slitting, recoiling and flat-sheet slitting lines. Annealing furnaces and auxiliary equipment are being made by Westinghouse

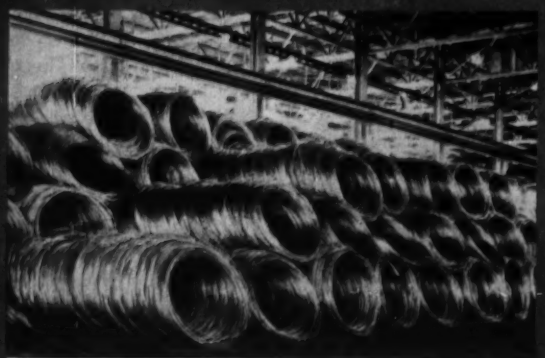
(*Please turn to page* 90)

Products of Sixty-Seven Years of Pioneering in Aluminum

Your Alcoa Distributor is as near as your telephone, and his warehouse is stocked with the aluminum products you need for fast, economical production. His facilities include modern equipment for sawing, shearing and slitting stock to your specifications and for making prompt deliveries.

EXTRUDED SHAPES: For truck and trailer floors, thresholds, window sills, door frames, glass stops, copings, gravel stops, trim, channels, tees, zees, etc.

TUBE AND PIPE: Coiled tube; Alcoa® Utilitube; straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; construction pipe; rigid conduit.



WIRE: Coiled and straight length; flattened wire; rivet wire and rod for die heading operations in manufacture of rivets, nails, bolts and screws.

Your Guide to Aluminum Value

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA

©ALCOA

Your Local Alcoa Distributor Is Listed Here

Alcoa Distributors

ALABAMA
Birmingham
Hinkle Supply Company

CALIFORNIA
Berkeley
Ducommun Metals & Supply Co.
Los Angeles
Ducommun Metals & Supply Co.
Pacific Metals Company, Ltd.
San Diego
Ducommun Metals & Supply Co.
San Francisco
Pacific Metals Company, Ltd.

COLORADO
Denver
Marsh Steel Corp.
Metal Goods Corporation

CONNECTICUT
Milford
Edgcomb Steel of New England, Inc.

FLORIDA
Jacksonville
Florida Metals, Inc.
Miami
Florida Metals, Inc.
Tampa
Florida Metals, Inc.

GEORGIA
Atlanta
J. M. Tull Metal & Supply Co., Inc.

IDAHO
Boise
Pacific Metal Company

ILLINOIS
Chicago
Central Steel & Wire Company
Corey Steel Company
Steel Sales Corporation

INDIANA
Indianapolis
Steel Sales Co. of Indiana, Inc.

KENTUCKY
Louisville
Williams & Company, Inc.

LOUISIANA
New Orleans
Metal Goods Corporation

MARYLAND
Baltimore
Whitehead Metal Products Company, Inc.

MASSACHUSETTS
Cambridge
Whitehead Metal Products Company, Inc.

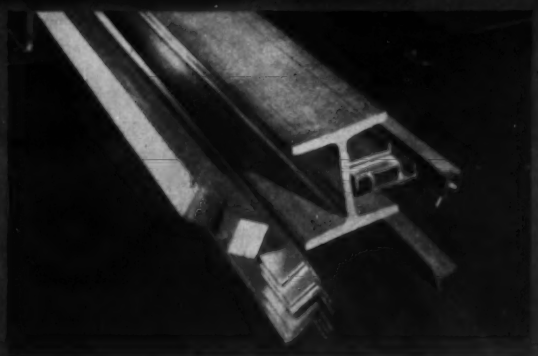
MICHIGAN
Detroit
Central Steel & Wire Company
Steel Sales Co. of Michigan

MINNESOTA
Minneapolis
Steel Sales Co. of Minnesota

MISSOURI
Kansas City, North
Marsh Steel Corp.
Metal Goods Corporation
St. Louis
Metal Goods Corporation

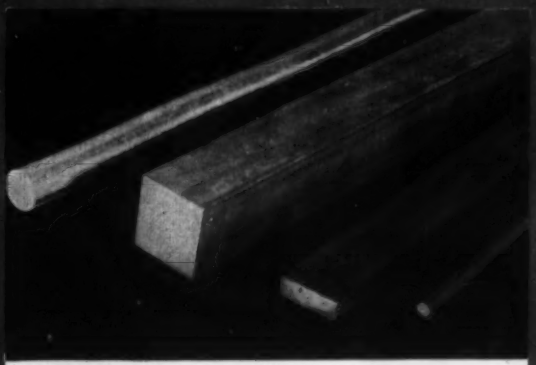
NEW HAMPSHIRE
Nashua
Edgcomb Steel of New England, Inc.

NEW JERSEY
Harrison
Whitehead Metal Products Company, Inc.

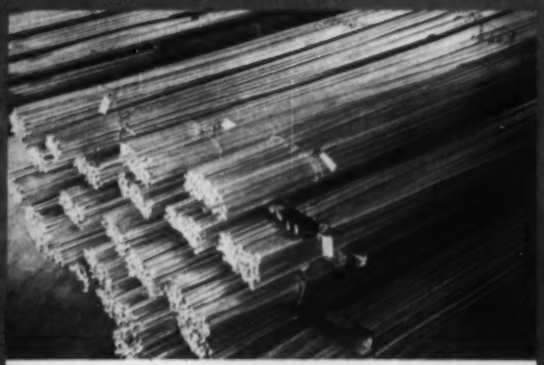


ROLLED SHAPES: Equal angles; unequal angles; channels; I-beams; tees; zees. Suited to a variety of structural applications.

SHEET AND PLATE: Flat and coiled sheet; circles; patterned sheet; plate; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.



BAR STOCK: Square, hexagonal and rectangular in all commercial alloys. Rolled and cold finished to final dimensions for superior tolerance and finish.



SCREW MACHINE STOCK: Available in 2011-T3, the free-machining alloy, and 2017-T4, a higher strength alloy, plus 2024, 6061 and 7075.

FASTENERS: Machine screws, wood screws; washers; nuts; bolts; rivets. Recommended for fastening aluminum to prevent electrolytic damage.

WELDING AND SOLDERING: Welding and brazing wire; welding and brazing flux; solder flux; solder.

Hillside
Miller Steel Co.
Kenilworth
Kenilworth Steel Company
Newark
Parr Electric Co., Inc. (Conduit)

NEW YORK

Albany
Eastern Brace-Mueller-Huntley, Inc.
Buffalo
Brace-Mueller-Huntley, Inc.
Whitehead Metal Products Company, Inc.
New York (L. I. City)
Adam Metal Supply Co., Inc.
New York
Eastern Brass & Copper Co.
Henry B. Lust (Circles)
Manhattan Brass & Copper Co.
Strahs Aluminum Co., Inc.
Whitehead Metal Products Company, Inc.
Rochester
Brace-Mueller-Huntley, Inc.
Syracuse
Brace-Mueller-Huntley, Inc.
Whitehead Metal Products Company, Inc.

NORTH CAROLINA

Charlotte
Edgcomb Steel Company

OHIO

Cincinnati
Williams & Company, Inc.
Cleveland
Jones & Laughlin Steel Corp.
The Hamilton Steel Warehouse
Williams & Company, Inc.
Columbus
Williams & Company, Inc.
Toledo
Williams & Company, Inc.

OKLAHOMA

Tulsa
Metal Goods Corporation

OREGON

Portland
Pacific Metal Company

PENNSYLVANIA

Philadelphia
Edgcomb Steel Company
Whitehead Metal Products Company, Inc.
Pittsburgh
Williams & Company, Inc.
York
Edgcomb Steel Company

TEXAS

Dallas
Metal Goods Corporation
Houston
Metal Goods Corporation

UTAH

Salt Lake City
Pacific Metals Company, Ltd.

WASHINGTON

Seattle
Pacific Metal Company

WISCONSIN

Milwaukee
Central Steel & Wire Company
Steel Sales Co. of Wisconsin

DURALOY
DURASPUN

HIGH ALLOY CASTINGS FOR HIGH TEMPERATURE SERVICE

1700°F

Here's an Annealing Retort for 1700° F Service
35% Ni—15% Cr
30" Diameter 30' Long

Duraloy is the place to come for high alloy castings—for high temperature service, for highly corrosive service. Castings to your specifications are a Duraloy specialty.

We are equipped to do large and small work. We can turn out single static castings of 7 tons or more and single centrifugal castings up to about 4½ tons. On your next high alloy casting job, check with Duraloy!

Send for Bulletin No. 3354-G

THE DURALOY COMPANY
OFFICE AND PLANT Scottdale, Pa.
EASTERN OFFICE 12 East 41st Street, New York 17, N. Y.
DETROIT OFFICE 2306 Woodward Avenue, Pleasant Ridge, Mich.
CHICAGO OFFICE 332 South Michigan Avenue

(*Concluded from page 87*)

Electric Corp.'s plant in Emeryville, Calif.; Surface Combustion Corp., Park Ridge, Ill.; and Gas Machinery Co., Cleveland. Hydraulic Press Mfg. Co., Mt. Gilead, O., is supplying a scrap baling press.

Steel Distributors Merge

Merger of Hawkridge Bros. Co. and H. D. Evans Steel Co. becomes effective June 30. The new firm will operate under the former name. Evans maintains a steel warehouse in Boston; Hawkridge is in Malden, Mass., and Waterbury, Conn.

Will Anodize Aluminum Parts

Hetherington Inc., Sharon Hill, Pa., producer of switches, installed facilities to anodize aluminum components. The firm uses the Dual-Film "EC" process, having acquired a license from Colonial Alloys Co., Philadelphia.

Rockwell Renames Subsidiary

Rockwell Mfg. Co., Pittsburgh, changed the name of its Canadian subsidiary, Callander Foundry & Mfg. Co. Ltd., to Rockwell Mfg. Co. of Canada Ltd. The Canadian plant in Guelph, Ont., produces power tools and electrical conduit fittings.

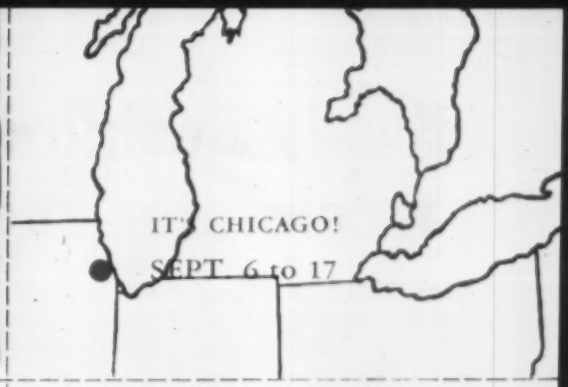
Weiner Buys Dalton Gear Co.

Dalton Gear Co., Minneapolis, has been purchased by J. K. Weiner. Representative of the firm is Minnesota Bearing Co., headed by Mr. Weiner. Dalton makes microscopic to 36-in. gears.

Opens Foundry in Oregon

Precision Castparts Co. moved into its 48,000-sq-ft plant at 5001 S.E. Johnson Creek Blvd., Portland, Oreg. This is one of the largest investment casting and shell molding foundries in the West and more than doubles the company's previous operating facilities. The foundry has a battery of tool and diemaking equipment, ranging from lathes and mills to contour-duplicating devices. The molding and casting departments employ the latest custom-built wax injec-

New



Series 90 Dyna-Shift

Metal-working

Don't miss the NMTBA's Machine Tool Show in Chicago—September 6 to 17 and don't, for better business' sake, miss our Monarch display there!

Object of the show, of course, is to demonstrate what the industry's best engineering brains have developed in the way of machines that lower costs by improving both output and accuracy.

Techniques—for

We'll be there, for instance, with a great many new lathe improvements, including two freshly announced this year. Those would be our new Series 90 Dyna-Shift Heavy Duty Lathe, plus the new Series 62 Preselector Dyna-Shift. So productive and so absolutely different as to defy comparison, they are two of many reasons why you cannot afford to miss *the world's best investment—in action.*

Series 62 Preselector Dyna-Shift

Business

We'll have more, too. And looking them over will be good for business—yours and ours, both. See you at the show! . . . . . THE MONARCH MACHINE TOOL COMPANY, SIDNEY, OHIO.

Advance-ment

Monarch

TURNING MACHINES

FOR A GOOD TURN FASTER — TURN TO MONARCH

Bundy design increases production on accelerator rods—saves 45% on costs

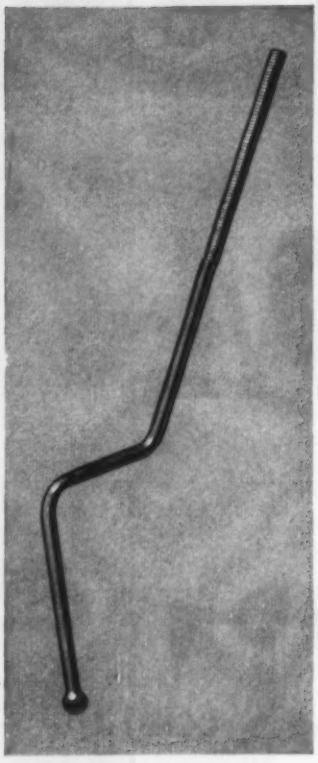
At right is a typical example of how Bundy can operate to help you in your design needs. In this application, the solution to the problem of accelerator rod production was not only simplified design, but a remarkable cost savings of 45%!

Why not check with us in your own tubing design needs? When you call in a Bundy Engineer at the design stage of your product, you can be assured of successful results. As the leading manufacturer of small-diameter tubing, Bundy has developed an engineering staff of experts who can tackle and help solve your most difficult problems.

Find out about the high quality of Bundyweld Tubing. Remember, Bundyweld is the only tubing that is double-walled, yet stronger. It has high thermal conductivity, high bursting strength, is leakproof, and takes easily to any fabrication operation. Bundyweld is the safety standard of the refrigeration industry, *and is used in 95% of today's cars, in an average of 20 applications each.*

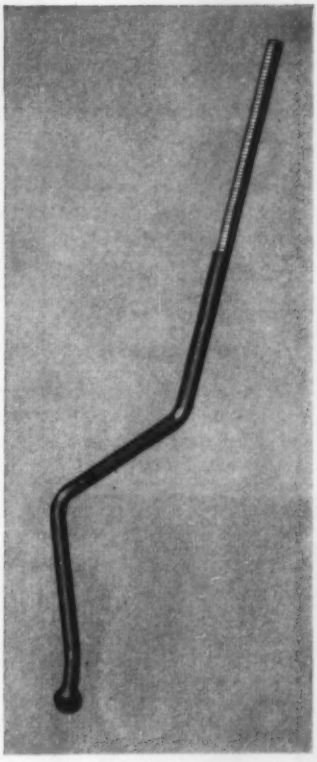
For further information, call, write, or wire us, today.

BUNDY TUBING COMPANY
DETROIT 14, MICHIGAN



PROBLEM:

Building a light touch into an automobile accelerator used to be an expensive proposition. Rod linkage has to be rigid and precisely machined. For example, the solid steel rod shown above had to be forged into a ball on one end, machined and threaded on the other, and bent to a precise configuration on a press. These operations were very costly.



SOLUTION:

The simplified Bundy design started with a piece of ¼" O.D. Bundyweld. A spherical end is formed by automatic press at a high production rate. The other end is swaged and roll threaded, and the rods are bent to specifications on hand fixtures. Result: accelerator rods were produced at 45% savings in cost, at a higher rate of production than the old way.

Bundyweld starts as a single strip of copper-coated steel. Then it's

. . . continuously rolled twice around laterally into a tube of uniform thickness, and passed

through a furnace. Copper coating fuses with steel. Result . . .

Bundyweld, double-walled and brazed through 360° of wall contact.

NOTE the exclusive Bundy-developed beveled edges, which afford a smoother joint, absence of bead, and less chance for any leakage.

BUNDYWELD TUBING®

DOUBLE-WALLED FROM A SINGLE STRIP

tion, centrifugal casting and induction-melting equipment, including a 100-kw motor generator set for handling large production melts. The finishing department is equipped with cutting, grinding and general finishing tools.

Chrysler Unites Operations

Chrysler Corp., Detroit, integrated its Nine Mile Press plant operations with its Automotive Body Division. The 1.2-million-sq-ft press plant, which supplies body stampings and assemblies to all the firm's passenger car and truck divisions, has been placed under the management of J. E. Brennan, general manager, Automotive Body Division. Roy Blasiola is manager of the press plant.

Vermont Firm Diversifies

For further diversification in the metalworking industry, Vermont Marble Co., Rutland, Vt., acquired Callahan Can Machinery Co., Brooklyn, N. Y. The operation is being moved to Rutland. Vermont Marble went into metalworking during World War II and has continued to operate on subcontract orders.

Sterlairco Inc. Organized

United States Air Conditioning Corp., Minneapolis, and Sterling Radiator Co. Inc., Westfield, Mass., organized Sterlairco Inc. The new company, owned jointly by U. S. Air Conditioning and Sterling's Heat Specialties Division, has its main office and factory in Westfield. It has taken over the manufacture of gas-fired unit heaters. G. H. Stenner, president of Sterling's Heat Specialties Division, is president of the new company. C. E. Scott is vice president and general manager.

REPRESENTATIVES

Federated Metals Division, American Smelting & Refining Co., New York, has been appointed exclusive agent for a line of plating chemicals manufactured by Incar Inc., Cleveland.

(*Please turn to page* 96)

ALLEN HEAD
ALLEN KEYS
New bright finish
New kit
Lower prices**
Now the hex keys furnished in Allen key sets have a high luster coating — better looking — rust resistant — makes size markings easier to read.
Available in six sets, all packaged in new red-trimmed plastic envelopes.
No. 603 11 short arm keys 3/32" through 5/8"
*No. 604 7 short arm keys 5/64" through 1/4"
*No. 605 6 short arm keys .050" through 5/32"
No. 606 11 short arm keys .050" through 3/8"
No. 614 11 long arm keys 3/32" through 5/8"
*No. 616 9 extra long arm keys 5/64" through 3/8"
*Bright Coated Keys **On Nos. 604 and 605
Order from your Allen Industrial Distributor or write us for bulletin C38 for your files.
ALLEN Manufacturing Company, Hartford 2, Connecticut, U.S.A.

Cut
STAINLESS STEEL buying costs!
SPECIFY
MicroRold®
SHEETS ROLLED TO THE LIGHT SIDE OF THE GAUGE RANGE
Washington Steel's production methods provide new economies in the purchase of stainless sheet. The controlled accuracy of gauge in the rolling process gives you more area per ton or the equivalent area with lesser weight. This close adherence to specified gauge also results in longer die life.
Washington Steel
CORPORATION
WASHINGTON, PENNSYLVANIA
Your steel warehouse distributor will gladly tell you the Micro-Rold Story.

REPUBLIC BOXES and simplify parts handling

Republic Boxes and Skids are used on the production line at Toledo Scale. Parts are moved from one machining operation to another quickly and easily by lift truck or hand-operated units.

Finished parts are stored in neat areas like this. Boxes are labeled with part numbers. Box and skid design permits easy visual inspection for inventory checks. Fits in nicely with other-type units.

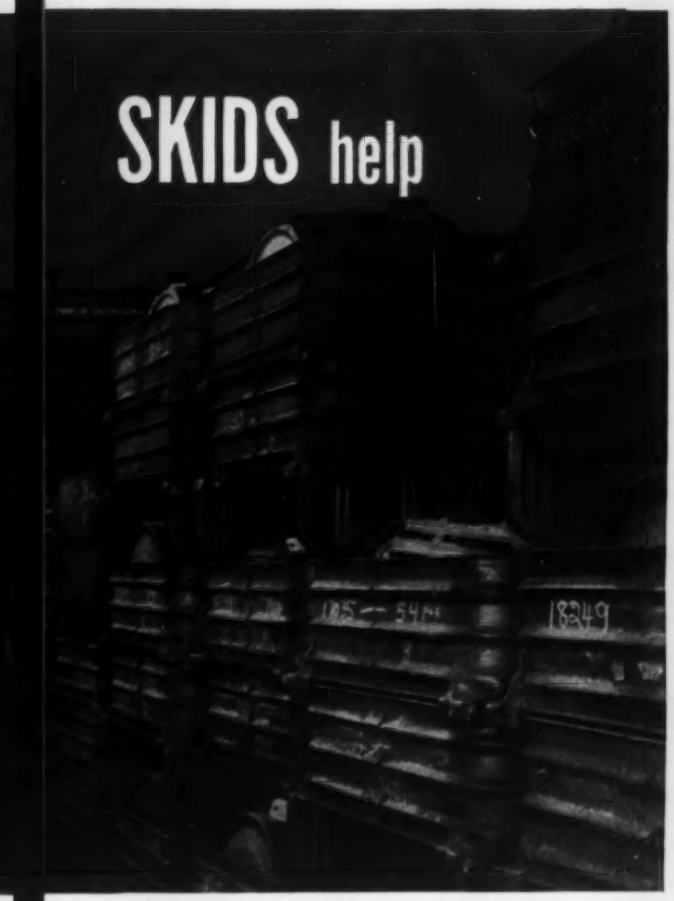
...provide Toledo Scale with keep everything

Neat, wide, uncluttered aisles are typical of the Toledo Scale Company plant at Toledo, Ohio. Republic Steel Box and Skid Units are used at practically every stage of production, from receiving to shipping.

For example, keeping track of and handling the thousands of parts needed for the products manufactured by Toledo Scale could be a difficult job. But, the company does it efficiently and at low cost with the help of Republic PB-130 Box and Skid Units.

These units are specifically designed for stacking. Box capacity can be varied by adding or removing ring sections. Stacking brackets are welded to the bottom corners of each box. Tiering lugs are welded to some boxes so that, when they are used as the top section, additional complete units can be tiered.

The skids are equipped with bumper-type channel runners. These are arc welded to the skid legs adding



a place for everything— in its place

strength to the sides and protecting skid ends and floor surfaces.

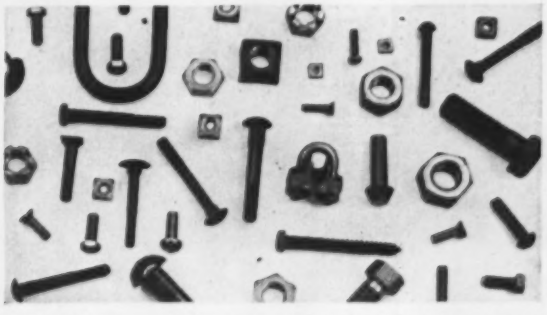
The PB-130 is only one of many types of box and skid units manufactured by Republic's Pressed Steel Division. There is a wide range of sizes from which to choose. Or if you have a special handling problem, Republic engineers are available to help you design a unit to meet your individual requirements. The coupon will bring you more facts by return mail.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

SIMPLIFY WEIGHT PROBLEMS WITHOUT LOSS OF VITAL STRENGTH. The high strength-to-weight ratio of Republic Alloy Steels permits smaller sections to carry heavier loads safely, like the gears and shafts of this huge power shovel. Vital parts are tough—resist shock, impact, vibration. Republic metallurgists will help you select the proper analysis for your product.

SIMPLIFY YOUR FLAT ROLLED STEEL PROBLEMS. Republic produces a wide line of flat rolled products including hot and cold rolled sheets and strip, galvanized, galvannealed, electro-zinc-plated, silicon steels and many others. The world's widest strip mill—98 inches—operated by Republic, produces steel wide enough for one-piece auto tops.



SIMPLIFY YOUR FASTENER BUYING. Republic's Bolt and Nut Division makes more than 20,000 regular types and sizes of headed and threaded products—over 8,000 specials. Everything from machine bolts to "Nylok" Nuts and high-strength bolts. You can depend on Republic Fasteners for quality, ease of application, uniformity, long service life. Quick delivery, too.

REPUBLIC STEEL CORPORATION
3120 East 45th Street
Cleveland 27, Ohio

☐ Please have a Materials Handling Engineer call.

Please send more information on:

☐ Materials Handling Equipment ☐ Alloy Steels
☐ Sheets ☐ Fasteners

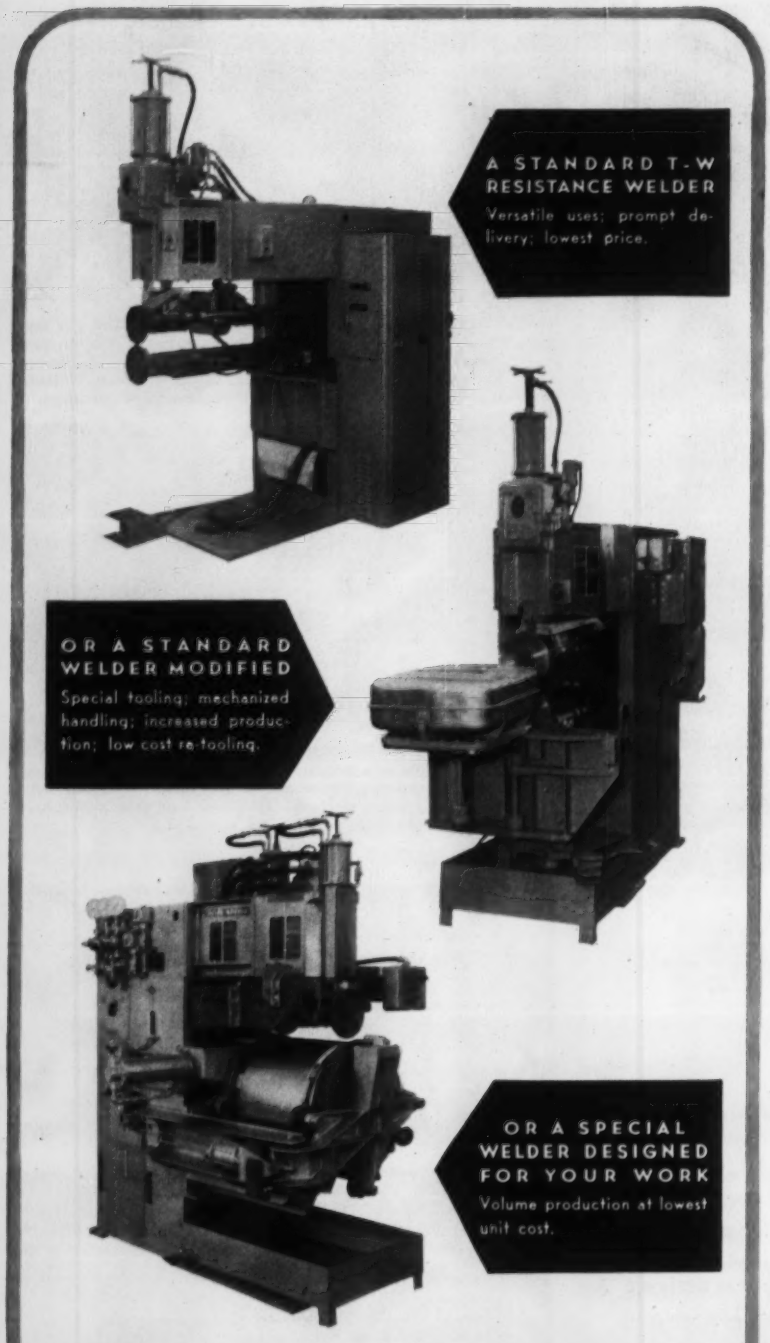
Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

K-6033A


A STANDARD T-W RESISTANCE WELDER
Versatile uses; prompt delivery; lowest price.
OR A STANDARD WELDER MODIFIED
Special tooling; mechanized handling; increased production; low cost re-tooling.
OR A SPECIAL WELDER DESIGNED FOR YOUR WORK
Volume production at lowest unit cost.

Resistance Welders Since 1898

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RESISTANCE WELDERS
SPOT • PROJECTION • SEAM • FLASH BUTT

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PORTLAND, OREGON • SEATTLE
ST. LOUIS • STAMFORD • WASHINGTON
OAKVILLE AND WINDSOR, ONTARIO

THE TAYLOR-WINFIELD CORPORATION WARREN, OHIO

(*Continued from page* 93)

Wolverine Tube Division, Calumet & Hecla Inc., Detroit, appointed C. P. Whitlock sales representative in Philadelphia.

Michigan Drill Head Co., Detroit, maker of special production machines and drilling equipment, appointed Barker Industrial Equipment Ltd., Toronto, Ont., exclusive sales and service representative in Canada.

Atlantic Steel Co., Atlanta, has been appointed distributor for aluminum warehouse products by **Kaiser Aluminum & Chemical Sales Inc.**, Oakland, Calif. M. C. Sarran is manager of Atlantic's Warehouse Division.

VACATIONS

Steel Improvement & Forge Co., Cleveland, will close its Champion Division plant (3685 E. 78th St.) for vacation from June 26 to July 11; its home plant (970 E. 64th St.), from July 24 to Aug. 8.

ASSOCIATIONS

Bert L. Wood will retire Oct. 1 as consulting engineer on the American Iron & Steel Institute staff, New York. He will be succeeded by W. G. Kirkland, who joined the staff in 1947 and has served as resident engineer in the western states. Mr. Wood will continue with the Institute as a part-time consultant.

NEW ADDRESSES

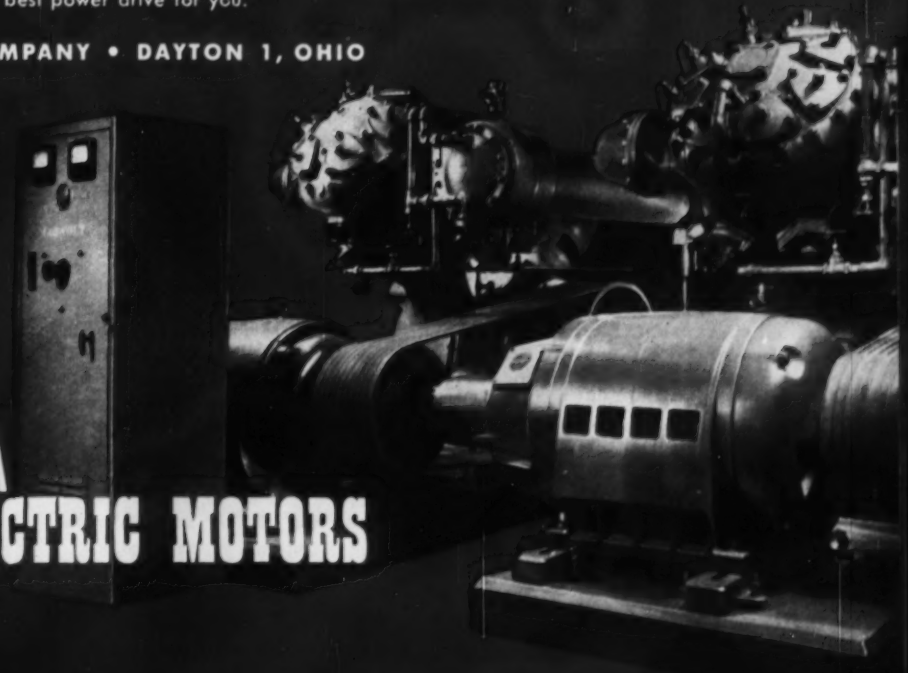
Lindquist Pump Corp. of Texas (formerly Lindquist Pump Corp., Culver City, Calif.) moved its general sales offices and engineering department to 2207 Border St., Torrance 3, Calif. Henry L. Seale is the newly elected president and chairman of the board; J. D. McNeff, executive vice president; John Erhard, secretary; T. A. Benavides, general sales manager. The corporation opened a warehouse at 3110 Lone Field Drive, Dallas.

What do you need in your electric motor drives . . . gear reduction . . . electric brakes . . . variable speed operation . . . fluid drive . . . special mountings or does a standard motor (like the 200 HP synchronous motor shown below) best suit your needs? Whatever it is, check with Master first. We offer you the widest selection of electric motor drives in the nation.

In thousands and thousands of ratings, ⅛ to 400 horsepower . . . in open, enclosed, splash proof, fan cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 430 to 1 ratio . . . with either magnetic or dynamic type electric brakes . . . with fluid-drive . . . with mechanical or electronic variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best power drive for you.

it's easy to get the right results

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO



MASTER

ELECTRIC MOTORS

Secret of a Whistling Good Shave

Another triumph of creative engineering

Friend of ours makes razor blades for a living. Tells us the secret of a whistling good shave lies in using a uniformly sharp blade every time.

Now, it's not so difficult to make a good blade, when money is no object. But to *mass produce* top blade quality for a price is an entirely different problem.

Taft-Peirce has recently built a number of machines to this customer's specifications. Each machine automatically grinds, sharpens, strops and hones a strip of metal. Mass produces finished razor blades of uniformly *better* quality, at a pleasingly *lower* cost.

Perhaps you have a special machine or machining problem like this that Taft-Peirce creative skills and experience can help you solve. For more information send for 92 page illustrated booklet, "Take It To Taft-Peirce."

We'll Design It . . . Some typical design assists by T-P engineers — a silent typewriter, automobile engine, automatic lens grinders, countless machine-tools and smaller mechanisms.

Tool It . . . Several large corporations rely exclusively on the T-P Toolroom for tool design and manufacture.

Make It . . . 1500 machine tools . . . 450,000 square feet of plant — provide the facilities for anything from a single simple part to thousands of complex units.

Test It . . . A separate production line may be set up in sequence operation — from manufacturing through assembly, test, and final inspection.

Ship It . . . Taft-Peirce offers you all or any part of these services.

For Engineering, Tooling, Contract Manufacturing

TAKE IT TO TAFT-PEIRCE

The Taft-Peirce Manufacturing Company, Woonsocket, R.I.

TELEPHONE: WOONSOCKET 1

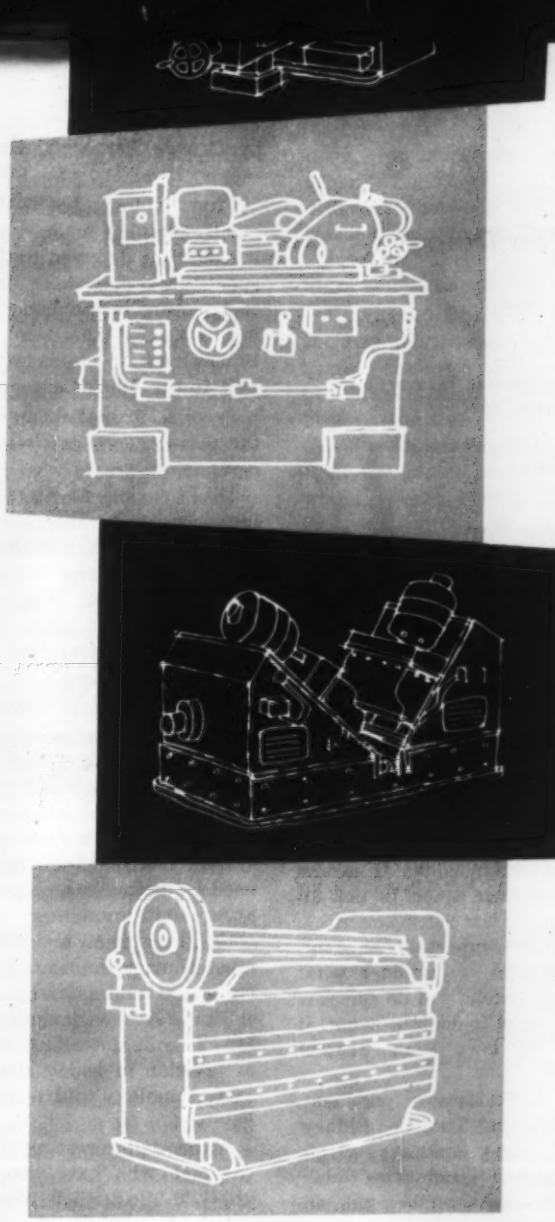
5

STEEL's 1955 Management Series . . .

The editors of STEEL herewith present the fifth in their ten-part series, Program for Management for 1955. The complete list:

1. **Product Promotion** (Feb. 14, p. 73)
2. **Budgeting for Cost-Cutting** (Mar. 14, p. 93)
3. **Plant Layout** (Apr. 18, p. 93)
4. **Communications** (May 16, p. 103)
5. **When To Re-equip** (June 20, p. 99)
6. **Put Business Trends To Work** (July 18)
7. **Consultants** (Aug. 15)
8. **Purchase Analysis** (Sept. 19)
9. **Market Facts** (Oct. 17)
10. **Keep Your Product Growing** (Nov. 14)

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department,* STEEL, *Penton Bldg., Cleveland 13, O.*



When To Re-Equip . . .

WHEN IT COMES to equipment, race drivers at Indianapolis have it easy compared with what metalworking men must face.

Both have the same objective: Get the best machinery to compete.

Both go through the same procedure to reach that goal: Know the latest developments and know when to make equipment purchases.

The "when" makes it tough for industrialists. If you're a top driver, you buy or rebuild practically every year. If you're a top metalworking man, the problem is far more complex.

The Guide — To help on the "when," STEEL's Simplified Guide for Re-Equipment gives a workable solution to that knotty problem.

Putting all the variables to work, the Guide delivers an answer that signals "replacement should be made" or "replacement should be delayed."

Foundation—The first requisite to using the Guide, or any replacement program, is sound judgment —educated horse sense. The rest of the job is built on it, and there's no substitute.

A second necessary part of replacement is a system that keeps management informed on how its equipment is doing when it comes to putting dollars into the till. This means you'll need adequate cost accounting.

How? — Re-equipment systems vary all the way from the straight

Developed by Machinery & Allied Products Institute

How Are You Doing?

Ask yourself three questions about your replacement practices.

1. Do you know what equipment in your plant could be replaced economically?
2. Do you know what it's costing your company *not* to make these replacements?
3. Does your company have a program for keeping both production and management informed on new replacement opportunities?

A "No" to any question means your replacement plan may be *costing* you money.

hunch (the "it looks good to me" approach) to complete statistical and financial analyses that cost more than they save.

One of the most common specifies a maximum time, say three years, in which new equipment is supposed to pay for itself through cost savings.

This is the same as the "rate of return" method. One is expressed in years (three); the other talks about per cent (33 1/3).

Common Fault—The wide variation in payoff periods points up the real problem. "How long should the period be?" "What should we look for in rate of return?"

You can't tell for sure. The correct figure will vary from plant to plant. It will vary from one piece of equipment to another.

If you specify a payoff period of two years, for example, you may be protecting antiques that already are past the replacement point. Equipment that cost $10,000 would have to save $5000 a year. If it promised to save only $1000 a year, you wouldn't buy. If every year it would save $500 more than it did the year before (because of a widening gap between the performance of your machine and the new ones), you'd wait eight years before new equipment would show your required $5000-a-year advantage.

The Cost—In those eight years, the wait would cost you $500 the first year, and $500, plus an additional $500, each year that follows. Total cost would be $14,000.

Premature replacement brings about the same type of unnecessary costs.

The Point—This isn't to say that here replacement should be made at any particular point. It means that this system alone is not an adequate guide for replacement.

It omits an important element. It's not enough to consider what the new equipment will do for you. You also must calculate what it will cost to keep your present equipment.

Jerome A. Raterman, president, Monarch Machine Tool Co., Sidney, O., says ". . .any company, weighing replacement possibilities today, should not only consider the advantages to be gained by replacement, it should also estimate the potential losses to be sustained by *failure* to replace."

What System?

You have a choice of many replacement systems. Most of them compare operating and capital costs of present equipment to those of a proposed substitute. Most compare both machines for the same period on the job.

If the new unit has an expected "life" of ten years on the job, the choice is between getting the new machine or keeping the old for ten years.

MAPI—More than ten years ago, the Machinery and Allied Products Institute brought out the widely accepted MAPI formula. Developed by George Terborgh, research director, it offers two advantages:

First, it indicates that replacement should be made now, or that it should be deferred until a better substitute comes along, or until the cost picture is changed. By figuring costs for the year following replacement, it avoids tying the old unit to the job for a specified time.

Second, it makes an allowance for obsolescence and wear of new equipment.

MAPI makes no pretense at being accurate in this allowance. It assumes new equipment will become obsolete and deteriorate at a constant rate. While in many cases this isn't true, it's better to make the assumption than it is to ignore the variable.

Drawback—F. L. Chapman, vice president in charge of sales, Gisholt Machine Co., Madison, Wis., says MAPI is "certainly the best of anything that has come to my notice," but one reason why the system has not been more widely used is "because the big words and unfamiliar terminology used would make the layman feel that it is too mysterious, complicated and theoretical to understand and apply."

That is a common criticism. MAPI is undertaking a program of revision in which simplification of terminology and technique is a key part.

It also is interesting to note that the men who have taken time to apply MAPI in their plants deny it is complicated. Their recommendation—if you understand MAPI, use it.

STEEL's Guide

The Guide on page 103 is based on MAPI, but it is an easier-to-use version. It brings all variables into the replacement picture.

The Guide is a single calculation of three things: The costs of operating present equipment and the proposed; the capital costs of keeping present equipment; and the capital costs of getting new equipment. It is designed to indicate which equipment offers the lower combination of operating and capital cost.

It can be used on single pieces or groups of equipment. It applies to machine tools, heat treating fur-

naces, welding equipment and other production facilities.

Operating Costs—For simplification, the first section of the Guide is broken down into "Labor Costs" and "Other Operating Costs." All are part of the same thing—the cost of running the equipment on the job next year.

Direct labor often is the biggest single influence. New equipment may be more automatic, easier to run, faster or it may permit several operations to be performed at once to eliminate a separate operation. All are part of the direct labor cost.

Same Basis — Operating costs must be calculated on the basis of the same output. One suggestion: Figure both on the production level of the superior equipment. Then calculate what it would cost to get that production using present equipment. This might be done by overtime, subcontracting, etc. This added cost would be listed under "Others."

Another suggestion is to calculate operating costs on the basis of the inferior equipment. Include the difference as a revenue advantage, also listed under "Others."

It makes no difference which is done, so long as a comparable production basis is used.

Revenues—The first two sections of the Guide should be figured on the basis of the job to be done during the first year after the analysis is made. All items listed are normal operating costs.

Under the blanks left for "Others," list income advantages. The gain or loss from replacement can't be counted only in costs. New equipment may permit you to design and produce a better product; it may produce to closer tolerances or permit re-specification of materials. Above all, new equipment may raise your capacity and production. Charge these advantages as costs of using the inferior equipment.

These income advantages, when they exist, are just as important to you as the costs. To ignore them would be like hiring a vice president solely on the basis of the salary you'd have to pay.

The Difference — These cost items are set up to produce a cash advantage for one piece of equipment (or a group) versus the other. When there is no significant difference between the two, don't waste time with the item. A word of caution: Don't assume equality until you've checked the item.

Equipment Costs—In addition to the cost of *running* the equipment, there's the cost of *having* it. On present equipment this includes the loss of salvage value. Since the Guide is based on next year's operation, you're not docked the whole salvage value—just the loss that will accrue during the year.

Salvage may be the sale value of the used machine, or it may be its worth if you move it to another operation. In the latter, worth should be not less than its sale value nor more than the cost of new equipment to do the job.

Suggested interest is 10 per cent. Use your own figure if you have one. All interest in the calculations should be set, at the risk of oversimplification, at about the rate your company is earning on its operating capital.

Rebuilding — It may be that you'll have to make some improvements in present equipment if you keep it—rebuilding, improved controls, automatic handling attachments, etc.

If changes are made, it's reasonable to expect they'll add some years to the life. Next year's cost is only a portion of the improvement investment. If a grinder must be partially rebuilt to the tune of $1500, and the job will make it last three more years, next year's share of the cost is $500.

Interest, however, is figured on the whole investment since it's all to be spent at once.

Proposed Costs—This section of the analysis charges two costs to the use of new equipment the first year. First, the interest on the installed cost is charged.

Second, it calculates the capital cost of using the equipment. The simplest way to do this would be to divide the total net investment (installed cost, minus anticipated salvage value, if significant) by

Ten Guideposts to Replacement Profit

No map or chart shows the most direct route to ideal replacement, but these ten Do's and Don'ts can steer you in the right direction.

do

Keep yourself and your key men informed on better ways of doing the job. Prime sources of information: Business magazines, trade shows, equipment salesmen and literature.

Use a work sheet as a guide so all important factors are considered.

Take advantage of new, more liberal amortization plans.

Consider what it will cost to defer replacement, which can be greater than the cost of replacing.

Consider more replacements than you can make—then you can act on the most profitable ones.

don't

Use equipment age as a sole criterion for replacement.

Refuse to investigate replacement because equipment is not fully amortized.

Try to use a replacement formula as a substitute for judgment.

Accept a replacement as final. Review it after it's made to check your judgment and sharpen your method.

Consider only present needs. Account for trends in production, tolerances, etc., that you'll have to be ready for.

the number of years the equipment will be profitable on the job—assigning an equal share of the cost to each year. But production equipment, like an automobile, loses more value in the first year than it does thereafter.

A Bonus—This calculation uses the MAPI chart, a simple presentation of a complicated formula. It figures the year's charge with an allowance for obsolescence and wear the first year.

This is one of the big plusses in the MAPI method. The chart gives an answer expressed in percentage. Multiply this by the cost of the equipment installed in your plant. Include the cost of foundations, additional power capacity and other expenses connected with putting the equipment to work.

The Result—It represents next year's costs of all items considered. They may or may not be the cost of operation—you may have skipped some factors showing no expected differences between present and proposed equipment.

The significant figure is the difference between the two total costs. This is the gain or loss you'll get next year from replacement. Obviously, if present equipment has the advantage, replacement is out of the question—at least for the present.

What Do You Do?

If proposed equipment shows a cost advantage, you have a replacement signal. (It's also the cost of *not* replacing.) How much of a signal does it take? Does a difference of a dollar spell replacement?

Theoretically, it does. All factors, including obsolescence, wear and tear and recovery of investment, with interest, are accounted for *before* the gain or loss is figured. If you had a bottomless well, filled with money, you'd replace at every gain signal.

Selection—The problem goes beyond spotting replaceable equipment. You also must know which indicated replacements represent the best dollar investment.

To do this, divide the gain in each case by the net investment. This answer represents the amount of gain per dollar invested. The equipment with the biggest gains

How To Use the Guide

This Guide will help you organize equipment replacement. It does two things: 1. It is a checklist of items that go into a replacement decision. 2. It provides a "paperwork" answer.

Here are the rules:

Steps 1 and 2—Compare the operating costs of present and proposed equipment. Figure them in terms of expected requirements for next year. Enter only those items that show a difference. If the cost of tooling will be substantially the same for both pieces of equipment, you needn't enter this set of figures. Consider any change in operational sequence. If, for example, new equipment eliminates a finishing operation, the cost of this operation should be charged to present equipment.

Calculate labor costs for both pieces of equipment at the same production level. Fringe benefit costs can be figured at 15 per cent of direct labor.

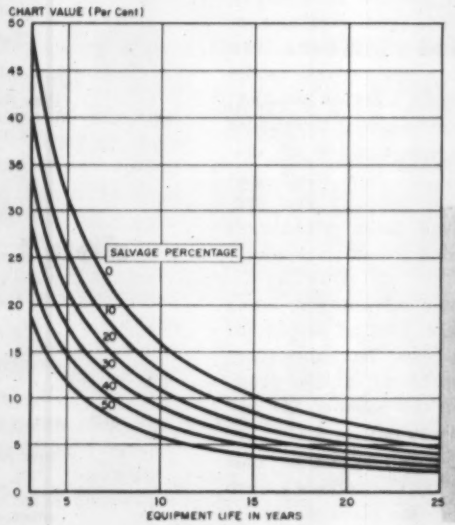
Under "Others" include the cost of scrap, floor space, power requirements, etc. *Be sure to include* any income advantages, such as increased capacity and improved product quality. Figure them as costs of using the inferior equipment.

Steps 3 and 4—Interest rates used here should be comparable to the return the money would bring if it were operating capital. Use the figures that best suit your operation. If you prefer, use an arbitrary 10 per cent.

In step 3 you can allow for modifications you'll make on present equipment if you keep it, like rebuilding or adding an attachment or improvement. It's fair to assume improved equipment will last longer than one year. Improvement cost can be divided by the expected additional life of the machine on that job to show next year's portion of the cost.

In step 4 an allowance is made for the cost of obsolescence and wear the new equipment will have in the coming year. The MAPI chart is used to calculate the percentage of original investment to allow for this loss—the Guide charges it as a cost of using the new equipment next year.

The Answer: If present equipment shows a lower total cost, replacement should be deferred. If the new equipment has the advantage, replacement is indicated. Don't attempt to interpret the advantage in terms of return on investment. All factors, including return on investment and obsolescence, are considered *before* the answer is reached. Theoretically, any advantage for the new equipment, no matter how small, justifies replacement.



STEEL's

Simplified Guide for Re-Equipment

PRESENT EQUIPMENT OR METHOD	PROPOSED EQUIPMENT OR METHOD
Age: **16 and 18 years** **2 milling machines**	**One new automatic rise-and-fall milling machine**

		PRESENT	PROPOSED
1. HOW LABOR COSTS COMPARE (dollars per year)			
Direct Labor (wages, plus incentives and bonuses)		$ 16,200	$ 10,450
Indirect Labor (supervision, inspection, helpers, etc.)			
Fringe Benefits (vacations, pensions, insurance, profit sharing, etc.)		1,940	1,254
2. HOW OTHER OPERATING COSTS COMPARE (dollars per year)			
Maintenance (only normal service costs)		930	81
Tooling, Supplies			
Down Time (include value of lost production time)			
Property Taxes and Insurance (if exact figures are not known, figure at 3% of value)		82	673
Others: **Scrap**		640	220
3. COST OF USING PRESENT EQUIPMENT			
Its salvage value today	$ 930		
Its estimated salvage value next year	$ 830		
Difference in salvage values	100		
Interest (10%) on today's salvage value	93		
Expense next year for rebuilding, improvements, etc.	$ 2,000		
Next year's cost: (Divide total by additional years of life)	400		(5-year life)
Interest (10%) on total expense for improvements	200		
4. COST OF USING PROPOSED EQUIPMENT			
Cost of equipment installed in your plant	$22,430		
First year's interest (10%) on installed cost			2,243
First year's cost of obsolescence (Figure this way):			
a. Estimate equipment life *on this job* Years:	15		
b. Estimate salvage value at end of that life	$ 1500		
c. Figure salvage value as a percentage of cost installed	6.7%		
d. Use equipment life and salvage percentage to find Chart Value in chart at bottom of opposite page	9.3%		
e. Multiply Chart Value times cost installed to get first year's cost of obsolescence			2,086
TOTAL COSTS FOR NEXT YEAR		$ 20,585	$ 17,007

GAIN OR LOSS NEXT YEAR FROM REPLACEMENT (Difference in total costs) **$3,578 (gain)**

Pick the point where equipment life (on this job) crosses the correct salvage percentage curve. Point opposite on the vertical scale is MAPI Chart Value.

per dollar invested should be replaced first. Then you can work down the list as far as available replacement capital will allow.

This also suggests that you should analyze as much of your equipment as possible. You should have figures on more replacements than can be made so you can pick the important ones.

Where to Start

It's impractical to make a detailed study of every piece of equipment in a plant. Some system should be worked out that will help determine which equipment needs closer analysis.

Many plants set an artificial limit on the age of equipment, say 15 years. While this system is better than none, it assumes that age and obsolescence are blood brothers. They're only second cousins.

It's true that most antiques in a plant are obsolete, but it's because the odds are great that a better way of doing the job has come along.

Obsolescence is a measure of the effectiveness of equipment on the job. It is measured in terms of other ways of doing the same job. This means equipment can be obsolete on one job, right for another. A turret lathe may be obsolete for the production work it's doing, but just right for the maintenance shop.

It follows that if an unwise purchase is made, the equipment is obsolete before it arrives at the plant. Obsolescence is more closely related to new developments than it is to age.

On this point, J. E. Brown, treasurer, Cooper-Bessemer Corp., Mt. Vernon, O., point out: "We do not consider that age is an accurate indicator of when a machine should be considered for replacement. It is altogether possible that obsolescence can make a relatively new machine too costly to retain."

Perfection—How can you know what equipment in the shop should be checked? The best answer is a good system of cost accounting. It will point up inefficient, costly equipment.

John O. Archer, director of industrial engineering, Harris-Seybold Co., Cleveland, also warns:

Four Steps to Modernization

ANNUAL SAVINGS of about $150,000—that's what Harris-Seybold Co. is getting out of an equipment replacement program at its Cleveland plant.

The company's eight-year-old "Capital Expenditure Guide Program" boosts the annual saving rate each year as new replacements are made. Similar programs at the printing equipment firm's other three plants are no less successful.

Replacement of about 30 pieces of equipment in the last 15 months at Cleveland cost the company almost $550,000. In the process the average age of equipment in this plant was trimmed from 13.3 to 11.5 years.

John O. Archer, director of industrial engineering for Harris-Seybold, outlines the four-step program this way:

First, all equipment is inventoried by type, age and condition. Data are carefully recorded and listed.

Second, Equipment that can be replaced practically in a five-year period is entered in a five-year plan—including the antiques, the bottlenecks, the ones that won't hold tolerances and the inefficient, high-operating-cost units.

Third, the five-year list is split into five one-year lists. The worst machines are brought to the top for replacement in the first year. Others are listed in order of replacement importance. The industrial engineering department begins to make detailed studies of all equipment on the first-year list. Each analysis is submitted to management for replacement approval. The list is then approved or adjusted to be consistent with over-all operating plans for the year.

Fourth, the program is studied for possible refinement and correction. An important phase is the review of past replacements to see how predicted results and savings compare with experience, providing a "make-good" report to management on each major purchase. This has led to some reweighting of factors. Future estimates and calculations will be increasingly accurate.

Each year the five-year and one-year plans are reviewed and adjustments are made.

Three Cases from Harris-Seybold's File

Driven by belting and shafting from a central drive motor, the old broaching machine was purchased in 1926. Production was low, maintenance expensive. It was replaced with an Oilgear horizontal broaching machine, Type XL-32x72, with a special roller support trough. Installed cost, including freight, was $12,486. Savings from reduced direct labor, maintenance and down time are about $4551 a year.

Old machines were four No. 2 Warner & Swasey bar turret lathes. Two were 18 years old, two were 8 years old.

Parts of the older machines were worn excessively. Tolerances were hard to hold. Maintenance costs averaged $195 a year for each of the machines. Down time cost $40 a year per machine; scrap cost $24. Despite age difference, all four were replaced at the same time with new W&S No. 2's—partly to avoid any need for different time standards in the same work center. New machines were put in at an installed cost of $38,827.80. Chief gains: Quality and quantity of output.

Old oil grooving machine was purchased (used) in 1926.

Maintenance cost was $43 a year, and was increasing each year. Because it was worn, the machine turned out low quality work, forced H-S to purchase bushings with grooves already cut.

A new Fischer No. 1 oil groover was purchased for an installed cost of $2753.50. Comparing the cost of subcontracting the work with that of doing it themselves, H-S engineers found they could save $1755.33 a year.

The Quick Check

IT'S USUALLY impractical to make a detailed analysis of each piece of equipment in your plant. Make a rough check, using major cost items. It will pinpoint cases that need more study.

This example shows how it can be done. A new machine tool is under consideration; best estimate is that it should last 15 years, winding up with no salvage value.

Using the MAPI chart, at 15 years life and zero salvage, an allowance of 10 per cent must be made for obsolescence (and deterioration). Since the first year's interest on installed cost also is 10 per cent, the new equipment must show an operating and capital cost advantage of 20 per cent of its cost (sum of the interest and obsolescent charge) to justify replacement.

Now, consider elements which usually weigh most heavily in replacement decisions:

1. Direct labor costs (including fringe benefits).
2. Maintenance costs.
3. Down time costs.
4. Next year's cost for rebuilding, improvements, etc., of present equipment.
5. Any income advantages, such as higher production. Figure these as costs of using the inferior equipment.

If the analysis of the five items gives the new machine an advantage that's equal to a fair portion (say 50 per cent) of the required operating and capital cost advantage, a more detailed study should be made to justify replacement. The size of the "fair portion" can be adjusted as experience shows how effectively the technique is screening useless projects.

Source: Robert Oppenlander Jr., Cresap, McCormick and Paget, New York

"Watch for the equipment that foremen and production men route only secondary work to. If the equipment won't do first-grade work, it's a good subject for replacement."

H. R. Foss, director, manufacturing engineering office, Ford Motor Co., Dearborn, Mich., says: "We feel that all items should be replaced which have passed the point of productive efficiency, where high repair and maintenance costs are incurred or where down time is excessive.

Suspect equipment can be given the "quick check" to select those for more complete analysis.

Pick the Newcomer

The selection of proposed equipment is important since in the process the obsolescence of present equipment is determined. Equipment salesmen are good sources for information on new methods. The big problem is that they often are kept out of management's inner sanctum. They see only one or two persons in a plant, and they have little to say about replacement. It's sound advice to keep key men in touch with salesmen.

All responsible management men should keep informed through business magazines, conventions, etc. H. L. Hoefman, vice president, Link-Belt Co., Chicago, cites as a fundamental of good replacement: "Management and production men must be aware of new developments that apply to their operation."

Taxes

Depreciation and amortization really have no part in the replacement equation. Yet they are an important part of the total picture: They represent a source of capital that can be used for replacement.

The 1954 revenue act eased depreciation allowances to some extent. You can write off your equipment at rates that come closer to the real cost of ownership—a greater portion in the first part of equipment life. This can be done either with the declining balance or the sum-of-the-digits method.

Residue—The revenue act didn't put you on easy street though. It still uses Bulletin F which arbitrarily sets equipment life—average is more than 20 years. Bulletin F, though, has a new foreword that liberalizes its application.

The law applies only to those machines bought since Jan. 1, 1954. It does not concern used equipment.

Behind It All: Profit

Sound replacement is a vital part of doing business in competition. The man entering a 1925 Dusenberg in today's Indianapolis "500" would be laughed off the track. It was a great car in its day, but...

Likewise, obsolete equipment spells high operating costs and failure in today's highly competitive economy.

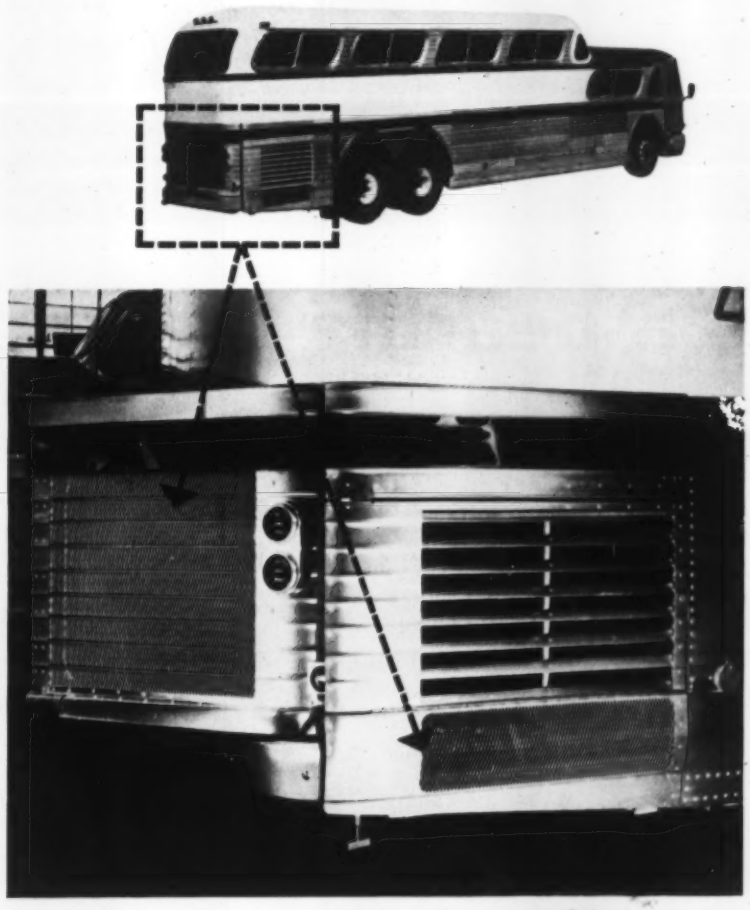
Here are the steps to intelligent replacement: Keep informed on what's new and on operating costs in your plant; use a Guide as a checklist of important factors and to allow for all the costs; consider what it costs *not* to replace; set up an organization to put replacement on a scheduled basis.

Finally, review replacements a year or so after they're made. Compare results with what you expected. It can help you tune your replacements to a high degree of accuracy.

Dr. G. J. Matchett, director, National Center of Education and Research in Dynamic Equipment Policy, Illinois Institute of Technology, Chicago, says the final test of any replacement is: "Will this decision put the firm in a more profitable position?"

With a sound system, you can tell.

DESIGN for lasting beauty and utility with *EXPANDED STAINLESS STEEL*



Shining examples of expanded stainless steel beauty, are the panels for the engine compartment of the large passenger coach shown here.

They're in perfect harmony with the rest of the stainless exterior. And, they are corrosive-resistant, easy-to-clean, durable. What's more, the open mesh permits air to circulate freely.

Penmetal expanded stainless steel is sheet metal that has been slit and expanded to as much as ten times its original width. Up to 80% lighter than solid sheet of the same dimensions, the diamond truss pattern adds rigidity and strength. Also available in carbon steel, aluminum, Monel, Inconel and other metals; large or small mesh; light or heavy gauge.

With its clean modern look, high utility, yet economical cost, Penmetal expanded stainless steel might well be your first step towards new markets and new profits. For details of Penmetal expanded stainless steel, send for new folder 506-EM.

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General Sales Office:
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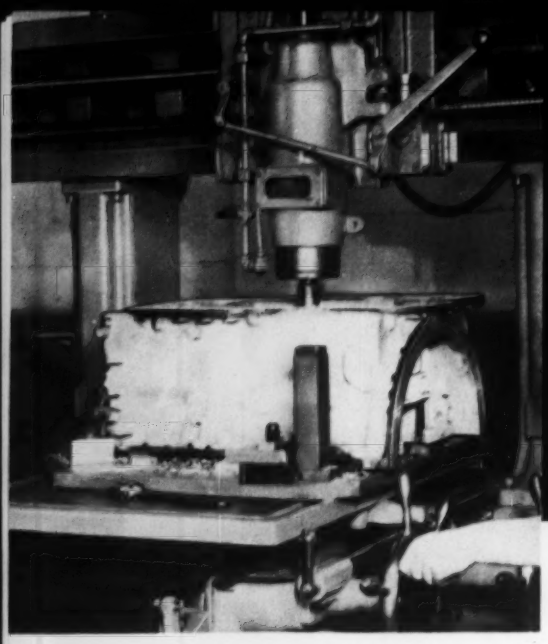
EXPANDED STAINLESS STEEL shelf in low temperature refrigerated water bath. The exterior expanded metal is of carbon steel.

PM-71



If limits are measured in .0001ths

chances are

Fafnir has a bearing on it

Precision designing and construction of the spindle head illustrated make possible extremely accurate profiling or milling at twelve operating speeds ranging from 260 to 6200 rpm. Design specifications include four pairs of Fafnir Super Precision Ball Bearings on the spindle shaft. These "jewels of industry" provide the ultimate in axial and radial rigidity. They run cool under exacting conditions of load and speed . . . conserve power . . . need no adjustment . . . and are permanently grease-packed.

It's in places like this where limits are in .0001ths that you find Fafnir Super-Precision Bearings . . . because they are *manufactured* in a separate super-precision department to the highest standards of dimensional control . . . in a wide range of sizes and types. There could be no better example of the "attitude and aptitude" of Fafnir engineers toward solving bearing problems.

If bearings are important to you, a few minutes spent with a Fafnir representative may help you get the right answer quickly.

The Fafnir Bearing Company,
New Britain, Connecticut.

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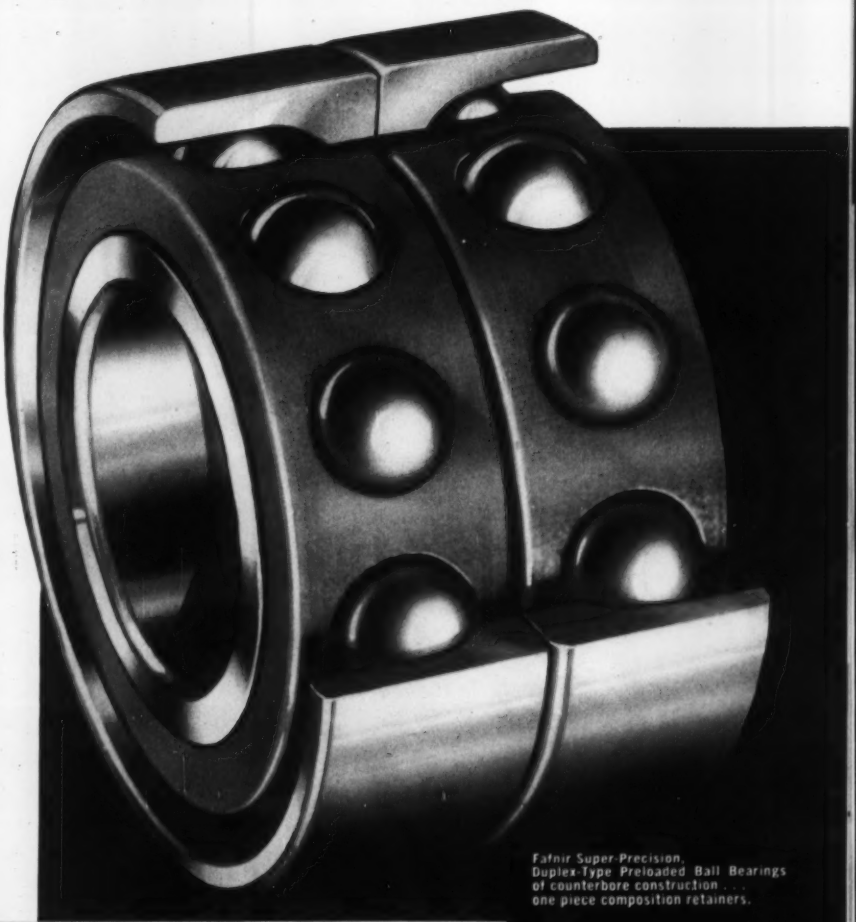


Fafnir Super-Precision, Duplex-Type Preloaded Ball Bearings of counterbore construction . . . one piece composition retainers.

FAFNIR BALL BEARINGS

STEEL
June 20, 1955

Technical Outlook

WELDING SHOW—Quite naturally, the big interest item at the American Welding Society exposition in Kansas City, Mo., was carbon dioxide shielded welding (STEEL, Jan. 31, p. 68). Enthusiasm seems to run in direct proportion to field experience, a happy sign for equipment builders that pioneered this argon substitute.

LOW-HYDROGEN ELECTRODE—For the first time, iron powder has been incorporated into the coating of a low-hydrogen electrode. This brings higher deposition rates with either alternating or direct current, and the manufacturer claims there is no detrimental moisture pickup in the rod coating for the first ten days of exposure to normal atmosphere.

REAL VERSATILITY—Another attention getter at the show was a single welding electrode that can be used for joining any dissimilar alloy combinations involving ferritic stainless, austenitic stainless, low alloy and mild steels as well as the high-nickel alloys.

HIGH-PRODUCTION PLUG-INS—Machine tool electronics are sometimes discussed in terms of maintenance problems. One answer may be control systems built up from plug-in components. When a circuit fails, the section can be pulled and a new one put in. The fault is corrected away from the machine while production continues.

BETTER BELTS—U. S. Rubber Co. says it is using a new electronic manufacturing method that guarantees every strand of cord in a finished V-belt is under the same tension and shares the load equally. Premature belt failures owing to unequal cord tensions are minimized. The new V-belts will be used on home appliances, fans, clothes dryers and washing machines and are a boon to the makers of equipment where vibration is a serious problem.

TAILORED TO THE NEED—Monsanto has a new fire resistant hydraulic fluid (Pydraul 150). It's for outdoor use in the steel industry at low ambient temperatures. Installed in an Askania regulator on a blast furnace in Gary, Ind., the fluid recently proved self-extinguishing when broken lines poured 350 gal of it into flames hot enough to melt the system's brass fittings.

CONFORMING GRINDER—By pleating and otherwise folding sheets of double coated abrasive cloth, and fixing them in a hub, Behr-Manning has come up with a flexible grinding wheel. It can be made soft or stiff, gives like a cloth buff, and can be shaped easily by the user to fit complex contours.

ACID ACTION—Titanium has gone to work in the "top hat" area of a nitric acid condenser. Other materials failed in three months. After the same period, titanium showed no corrosion.

ALUMINA COAT—Refractories, sprayed molten from a tool resembling a metallizing gun, are the latest in coatings. Norton Co. is licensing an aluminum oxide spraying process (Rokide) on a nonexclusive basis, with the expectation that it will find use in aircraft hot spots and other places where heat and hot gas corrosion are a problem. The coating is dense, hard, will withstand light flexing and its melting point is 3600° F.

Metalworking Outlook—p. 53 *Market Outlook—p. 145*

How To Cut Snagging Costs
1. Maintain constant wheel surface speed.
2. Maintain wheel work pressure consistent with wheel grade.
3. Use wheels with dense structure on rough jobs.

Save on Snagging

By JOHN A. MUELLER
Manager, Grinding Laboratory
The Carborundum Co.
Niagara Falls, N. Y.

Carborundum's mechanical snagger. Not visible are the control panel and the scales on which billets and snagging wheels are weighed before and after each test

INDUSTRY spends $25 million a year for abrasive snagging wheels. Is it getting its money's worth? The Carborundum Co. decided to find out. The problem was to take the guesswork out of snagging, where the human element is a big cost question mark.

Manhandled — The snagging wheel operator rides the wheel, swings it, bucks it. At Carborundum grinding laboratory in Niagara Falls, a machine was built which mimics the operator's actions without his eccentricity. It operates automatically, independent of the operator and operator technique, and can repeat the same series of actions any number of times.

It reproduces the motions of a man grinding steel in a mill or foundry: Angular motion in the horizontal and vertical plane, traverse motion across the steel and infeed motion against the steel. The degree of movement can be varied over a wide range and in such a way that motions are out of phase at all times.

Results obtained on the automatic snagger have been verified in the field.

Cause and Effect—Answers to three questions were sought from the tests: 1. What is the effect of reduced wheel speed owing to reduction in diameter through usage? 2. What is the effect of pressure on wheel performance? 3. What is the difference between the performance of open and dense structure wheels?

Under each point, three factors having a major influence on cost were evaluated: 1. Production rate, or the amount of metal removed per hour. 2. Power consumption, indicating required machine capacity to perform the operation. 3. Wheel performance, as indicated by wheel efficiency and life.

Diameter Reduction—The effect on performance as the wheel wears away is well known. How change in wheel diameter influences the cost of grinding is not so well known.

Tests showed that running the wheel at the same rpm throughout its life caused a substantial loss (Fig. 1). When the wheel wore from a diameter of 24 to 18 in., the cutting rate decreased 37 per cent. This loss began to show up in the first inch of wheel wear: 1 in. of wear resulted in a produc-

tion loss of 11 per cent.

The 37 per cent loss was reduced to 15 per cent simply by changing the wheel speed to maintain constant surface feet per minute throughout wheel life.

Power Loss—When wheel rpm was not changed, the 37 per cent drop in production rate was matched by a power consumption drop of 20 per cent (Fig. 2). This means that the grinder was operating at only 80 per cent of capacity, or that it would require five machines to do what four could do if operating at full capacity.

At constant speed it required less horsepower to remove a pound of metal per hour than at constant rpm (Fig. 3). More effective use was made of the available energy. Constant speed represents a saving in the cost of energy used for grinding.

Cutting Rate—The third factor is the wheel. More effective use was made of it when it was run at constant surface speed than at constant rpm (Fig. 4). Metal that the wheel will remove at constant speed is about 20 per cent more than at constant rpm.

The first phase in the cost reduction program is to maintain speed as nearly constant as possible. This will make for: 1. Faster metal removal rates. 2. Increased wheel efficiency. 3. Full utilization of available power. 4. The same production with fewer machines.

Pressure—The amount of pressure exerted on a grinding wheel determines to a great extent how it performs, and influences the selection of the type wheel to be used. It influences cutting rate, wheel life, wheel efficiency and power consumption.

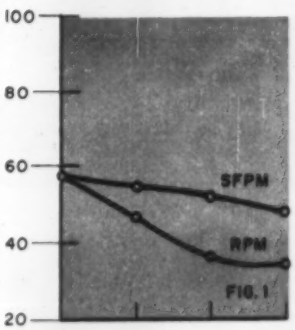
Two different wheels were studied: The open structure and the dense structure snagging wheel. The dense structure type showed a definite increase in cutting rate as wheel work pressure was increased (Fig. 5). For each 100-lb increase in pressure, the cutting rate increased 40 per cent. Tests did not find the pressure at which dense structure wheels broke down at an uneconomical rate.

Open structure wheels removed metal faster (Fig. 5). However, as pressure was increased, the cutting rate showed signs of approaching

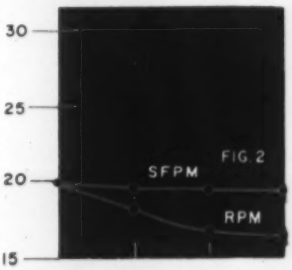
How Snagging Looks in the Laboratory

Constant rpm and sfpm

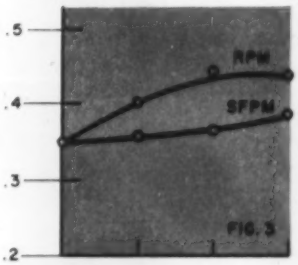
Metal removed—lb per hr



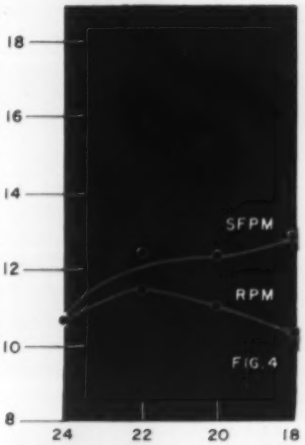
Total hp input



Hp input per lb of metal removed per hr

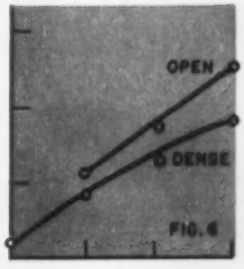


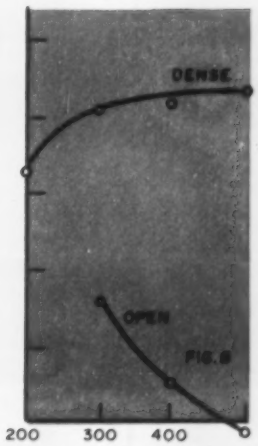
Efficiency ratio M/W



Wheel diameter—in.

Open and dense structure





Wheel work pressure—lb

Wheel grading: 12-grit Aloxite resinoid; wheel size: 24 x 3 x 12 in.; steel: 304 stainless; wheel work pressure: 300 lb; wheel speed: 9500 sfpm

Snagging Balance Sheet

WHEEL: 12 grit Aloxite resinoid STEEL: 304 stainless

Wheel diam in.	Wheel speed sfpm	Wheel work pressure lb	Wheel structure	Cutting rate lb per hr	Cutting rate per cent	Wheel loss per cent	Ratio per cent	Total hp input	Hp per lb of metal removed per hr
Change in Wheel Diameter									
24	9500	300	open	58.0	100	100	100	20.1	0.35
22	9500	300	open	54.8	95	82	116	19.7	0.36
20	9500	300	open	53.0	91	80	116	19.5	0.37
18	9500	300	open	49.4	85	71	123	19.3	0.39
22	8800	300	open	46.2	80	73	110	18.3	0.40
20	8800	300	open	38.2	66	63	104	16.7	0.44
18	7200	300	open	36.3	63	65	96	16.1	0.44
Change in Wheel Work Pressure									
24	9500	200	dense	32.2	100	100	100	15.8	0.49
24	9500	300	dense	45.2	140	130	111	19.6	0.43
24	9500	400	dense	56.1	174	160	112	21.5	0.38
24	9500	500	dense	71.9	223	200	114	24.3	0.34
24	9500	300	open	59.5	100	100	100	20.2	0.34
24	9500	400	open	86.7	146	180	81	24.0	0.29
24	9500	500	open	103.4	174	258	70	27.7	0.27

a maximum. An increase in pressure from 300 to 400 lb produced a 46 per cent increase in cutting rate, but when it was raised to 500 lb, the cutting rate increased only 28 per cent. This shows that further increase ultimately would result in lower cutting rates.

Open structure wheels consumed more power because they removed more metal at each pressure than the dense structure wheels (Fig. 6). The dense structure wheels required more energy to remove a pound of metal per hour than the open structure ones (Fig. 7).

Wheel Life — An increase in wheel work pressure materially cuts wheel life (Table). For each 40 per cent increase in cutting rate, dense structure wheels lost 30 per cent life. The life of the open-structure wheels was reduced 80 per cent with a cutting rate increase of 46 per cent when pressure was raised from 300 lb to 400 lb. At heavier pressures, life of the open structure wheels was cut so sharply that it would be impractical to use them.

This clearly points out that dense structure wheels can withstand heavier pressures—they lend themselves for use on rugged operations. Conversely, open-structure wheels cut faster than dense structure ones at the same pressure—they are suited for less rugged operations.

Efficiency — The ratio of metal removed per unit of wheel loss is a measure of how effectively the wheel cuts. Dense structure wheels were substantially more efficient than the open structure wheels at all pressures, particularly heavier pressures (Fig. 8).

The efficiency of the open structure wheels decreased 15 to 20 per cent for each 100-lb increase in pressure. At 500 lb of pressure, efficiency was so low that the operation would not be considered feasible. Manifestly, the dense structure wheels made more efficient use of the abrasive.

Rate for Rate—Compared when they removed metal at the same rate, the dense structure wheels proved 50 per cent more efficient than the open structure wheels and had 60 to 70 per cent more life. Equivalent cutting rates were produced when the dense structure wheels were used at 400-lb pressure and open structure wheels at 300-lb pressure (Fig. 5). In other words, dense wheels required about one-third more pressure to produce cutting rates equivalent to open structure wheels.

Conclusion: If the cutting rate of dense structure wheels satisfies production standards, they will be substantially more economical to use than open structure wheels.

In Terms of Cost—The second phase in the cost reduction program is to recognize that there is a maximum pressure beyond which the wheel will break down too rapidly for economical operation. Up to this point, an increase in pressure increases metal removal rate, at the expense of shorter wheel life.

The other factor to recognize is that dense structure wheels are more efficient but cut slower than open structure wheels. They lend themselves to rough, rugged operations where wheels are subjected to heavy pressures and positive infeeds. The open structure wheels are for lighter operations.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department,* STEEL, *Penton Bldg., Cleveland 13, O.*

Cutting Metal at 950 SFPM

New screw machine increases production 60 per cent for this part

THIS PART is made in 9 3/8-seconds from ½-in. diameter free machining brass rod. It figures out to 384 pieces per hour.

Length is 61/64-in. A ¼-in. diameter section is turned and threaded for half the part's length. A forming operation does the head, shoulder and two recesses.

There also is a knurling operation and the rolling of a tradename adjacent to the knurled portion.

Production includes crossdrilling a 3/64-in. diameter hole. A 1/16-in. hole is drilled in one end to a depth of ¾-in. The ratio between the depth of this hole and the diameter of the drill is 12 to 1.

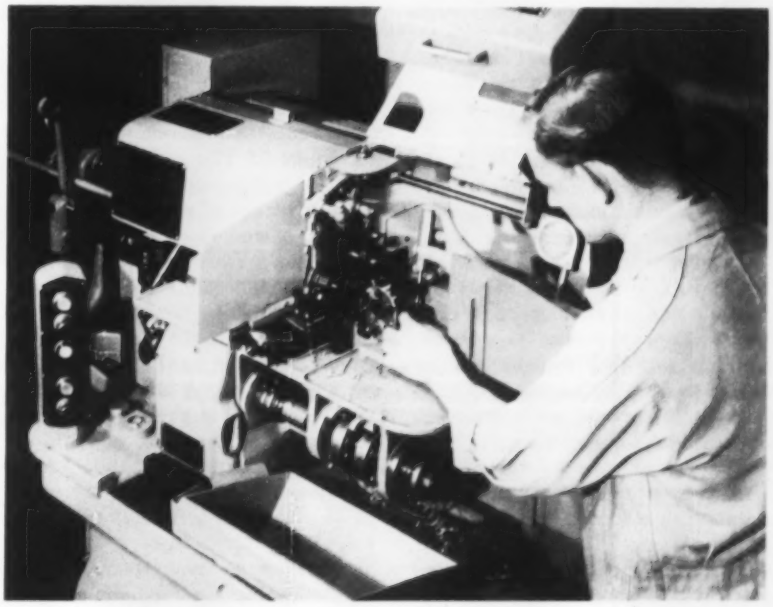
More Parts—All operations are performed on the new Brown & Sharpe No. 00 automatic screw machine (turn to page 131 for a description of it).

The production increase for this part is 60 per cent over the rate for the company's previous model 00. Both use the same type tooling and identical feeds.

Both Directions—The new machine has a top speed of 7200 rpm, a 20 per cent increase, and a low speed of 34 rpm. The old model has a high of 6000 rpm, a low of 50 rpm.

"Speed range is extended in both directions," says H. S. Sizer, director of design for machine tools, "to take full advantage of free machining metals and still handle tough stainless steels and materials difficult to thread."

Fast setup and minimum down time to change from one job to another are emphasized in the new machine. This is an important area for cost saving. As A. R. Sparrow, B & S's director of screw machine sales, puts it, "Automation started a long time ago on screw machines."



Turret slide can be adjusted forward by ¼-in., backward by ½-in.

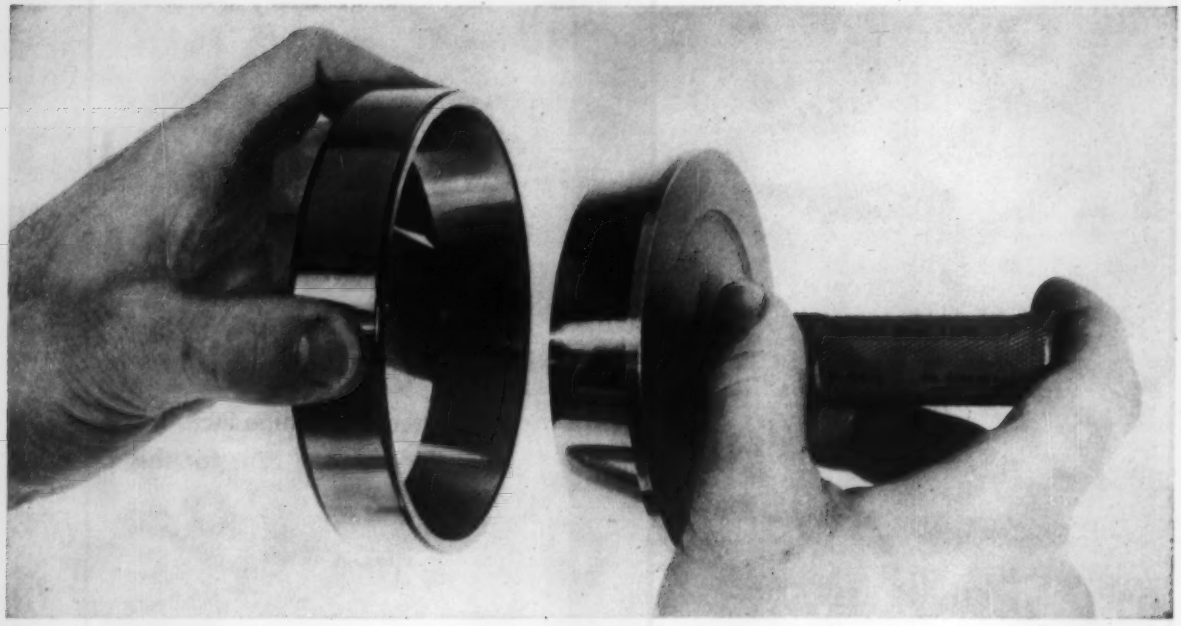


Fig. 1—Follow this gage. It won't get lost in the production shuffle

Who's Got the Gages?

Knowing where things are is as good as money in your pocket. Here's a system that keeps tab on half a million tools, gages and machine parts

TOOL AND GAGE control systems worth their salt save money: 1. They prevent loss. 2. They keep paper work to a minimum. 3. They save time. 4. They prevent over or under ordering. 5. They prevent mixups.

But finding the needle in the haystack is simple compared with keeping tab on circulating tools, gages and machine parts. Whether you have 500 tools and gages (or 500,000 like Timken Roller Bearing Co.), bookkeeping is a must. How do you keep it from getting out of hand?

After 30 years of experience with a tool-and-gage control system (much expanded 4 years ago), Timken says it has one that does a thorough job with a minimum of effort. It now covers 75 per cent of the tools, gages and machine parts in its five plants and is being extended to 100-per-cent coverage. To see how it works, let's follow a typical gage through the sequence.

Blue Card—In the manufacture of a roller bearing part designated "3920 cup," a finish-cup plug gage is required. You can see this cup and its mating gage above (Fig. 1). Production of 3920 cups is going up, and more gages will be required. The crib supervisor knows this because he has available a month-by-month record of production of 3920 cups for the past year (blue card, Fig. 2), and he will plan for a similar production pattern. If there is to be a big change in the pattern, the production department notifies him.

Salmon Card—The present level of production requires a group of six, 3920, finish-cup plug gages. The crib supervisor confirms this by checking a salmon-colored "group" card which shows six gages in use and on hand in the crib (Fig. 3). Since he needs one more for next month's production, he'll get it from inventory.

Green Card—The inventory record appears on a green card which shows extra gages on hand and on order (Fig. 4). The crib attendant withdraws one of them from the bin indicated, records the resulting inventory change on the green card and assigns the gage a serial number according to a standard code. He enters this number (84-2) and any other pertinent information, including the reason for removing the gage from inventory, on a record slip (Fig. 5).

With an electric vibrating needle, he etches the type (3920 Fin. Cup) and the serial number on the gage (Fig. 1). Now one more gage is noted in the "on-hand" column of the salmon card.

FORM 4204 PRINTED IN U.S.A. ACME 557564

MONTH	1952		1953		1954		1955		1956	
JANUARY	1	638								
FEBRUARY			5	534		731	1	107		
MARCH	62	999	25	021	16	840				
APRIL	55	974	60	607	38	005				
MAY	35	712	28	427	18	788				
JUNE	10	391	57	404						
JULY	16	198	14	038						
AUGUST		500	18	809						
SEPTEMBER			39	912						
OCTOBER	1	073	6	730						
NOVEMBER				520						
DECEMBER						795				
TOTAL	184	485	257	002	78	159				

3920 Cup

Fig. 2—Blue production record card

FORM 4205 PRINTED IN U.S.A. ACME 557564

ON HAND	DATE	ON HAND	DATE	ORD	DATE	REC	DATE	REMARKS
6	5-18-51	9	3-20-53					
7	5-24-51	8	8-25-53					
8	6-1-51	7	10-1-53					AMOUNT ON HAND AND AMOUNT ORDERED IF ANY. THIS CUP PLUG IS ONE OF THE 6 ON HAND IN ONE TOOL CRIB
9	6-4-51	(6)	3-16-54					
10	8-4-51							
8	8-20-51							
7	10-13-52							
8	10-16-52							

Fin. Cup Plug

BLUEPRINT BM-18172 SEC 32 BIN 51

PART NO.	TYPE	PART NO.	TYPE
		3920 Cup	Cup Plug

Fig. 3—Salmon group card

FORM 4205 PRINTED IN U.S.A. ACME 557564

ON HAND	DATE	ON HAND	DATE	ORD	DATE	REC	DATE	REMARKS
4	8-1-51			4	10-16-52	4	11-5-52	
3	8-4-51							
1	10-16-52							
5	11-5-52							
4	8-25-53							
3	10-1-53							
2	3-16-54							

Finished Cup Plug

BLUEPRINT BM-18172 SEC 32 BIN 51

PART NO.	TYPE	PART NO.	TYPE
		3920 Cup	Fin. Cup Plug

Fig. 4—Green inventory card

TOOL RECORD

DATE 11-5-52 PRODUCT PART NO. 3920

TOOL CRIB NO. 13-2 TOOL PART NO.

SCRAP RECEIVED X TRANSFER TO

SERIAL NUMBERS

84-	# 2	84- #5	
84-	# 3		
84-	# 4		

DESCRIPTION OF TOOL Fin Cup Plug

CHECK REASON FOR SCRAP

WORN OUT	
OBSOLETE PART NO.	
OBSOLETE PRODUCTION METHODS	

OTHER REASONS Replacement

PRINTED IN U. S. A. FORM 4231

SIGNED J. Bittler

Fig. 5—Record slip

GAUGES	ON HAND	HARDENING	ON HAND	GRINDING EQUIPMENT	ON HAND
LENGTH MAS. .9375		DROP		GRINDING CHUCK	
O.D. MASTER 4.4375		REGULAR PLUG	27	MAGNETIC GRIND	
CUP PLUG	9	OVERHANG PLUG			
GAUGING HEAD	4	ADJUSTABLE PLUG			
GAUGING MASTER	3	HARD PLUG MASTER			
REFERENCE MASTER	1	I.D. & O.D. GAUGE			
VAULT MASTER				HONING MACHINE	
STAND GAUGE				CUP SEATS	
DOUBLE STAND PLUGS				COLLET PADS	6
CONCENTRICITY AD #1	3				
CONCENTRICITY AD #2	1				

THIS CARD SHOWS ALL TOOLING FOR A PART NO. IN ONE PLANT. THIS CUP PLUG IS ONE OF THE 9 ON HAND IN THIS PLANT.

PART NO.	DESCRIPTION
3920	FINISH CUP TOOL AND GAUGE INVENTORY

Fig. 6—Central file inventory card

and the gage goes to the group bin shown on the card. The record slip goes to the central file in another part of the plant.

Central File—When the girls in the central file get the record slip, they will record the addition of one, cup-plug gage on a card which shows all finish tooling for part 3920 (Fig. 6). Records from all the tool cribs come here for consolidation.

Don't confuse the central file with the master file, a term Timken reserves for the records of master gages.

Yellow Card—Back in the tool crib, a yellow card is being made for gage 84-2. This will be the individual history for this gage, showing when it was first placed in service, how often it has been reconditioned or inspected (Fig. 7). The yellow card goes into the crib file along with the green, blue and salmon cards.

Enter the User—Here comes a machine operator to the tool crib. You've guessed it—he wants the gage we've been following. On a white requisition slip he fills in the number of the part on which the gage will be used, a description of the gage, his time clock number and his signature. The crib attendant adds the serial number of the gage and his signature, and places the slip in the bin from which the gage was removed. The operator gets back his requisition slip when he returns the gage.

Versatile—So far we've showed only how the system applies to gages. The same crib bookkeeping is used for tools and machine parts: Four colored record cards, a record slip and a requisition slip. The central file records are all on 5 x 8-in. cards, but they show considerable variety of form because of wide differences in tooling and gaging for different jobs.

Advantages — What makes the system better than the previous? For one thing, the crib supervisor knows the pattern of production. He's no longer reluctant to transfer tools and gages from his crib to others where they may be needed. It takes a minute instead of hours to locate a gage, or to find out exactly how many are available.

There's no needless duplication of gages, no double ordering or rush ordering because demand wasn't foreseen. If gages have to be called in to change dimensions, there's no chance of missing any. Most important, tools, gages and machine parts are where they are needed, when they are needed.

FORM 4208 PRINTED IN U.S.A. ACME 55795-6

DATE	REMARKS
8-4-51	Out For Regrind Ref.-8-18-51
10-13-52	Trans. to New Phila.
3-20-53	Ret. From New Phila.
10-14-53	Out For Regrind W/N-56682 Ref.-10-15-53
6-21-54	Out For Regrind W/N-73837 Ref.-6-23-54

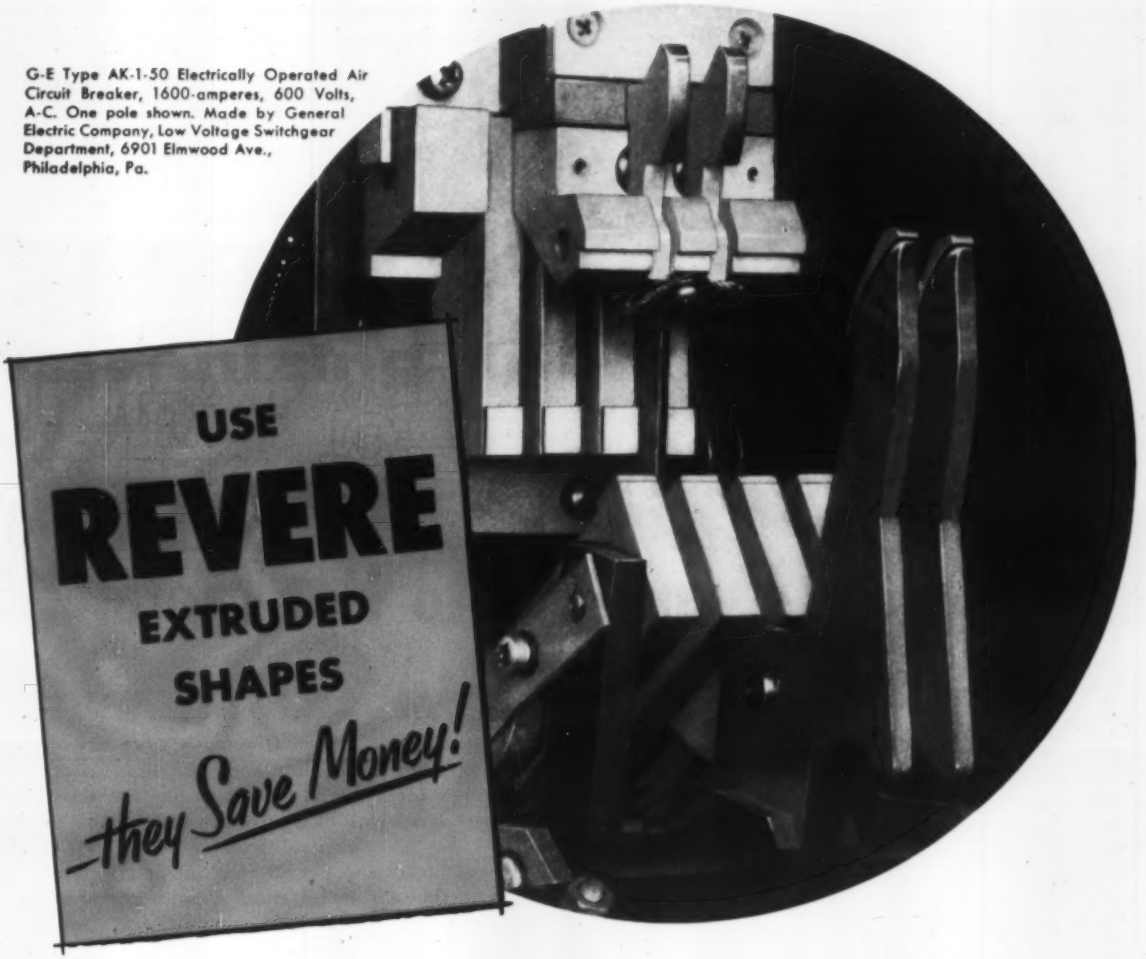
NOTE SERIAL NO. 84-2
ALSO MARKED ON CUP PLUG (FIG. 1)

SERIAL NO. 84-2

PART NO.	TYPE		PART NO.	TYPE
2 3920 Cup	Cup Plug			

Fig. 7—Yellow individual history card

G-E Type AK-1-50 Electrically Operated Air Circuit Breaker, 1600-amperes, 600 Volts, A-C. One pole shown. Made by General Electric Company, Low Voltage Switchgear Department, 6901 Elmwood Ave., Philadelphia, Pa.

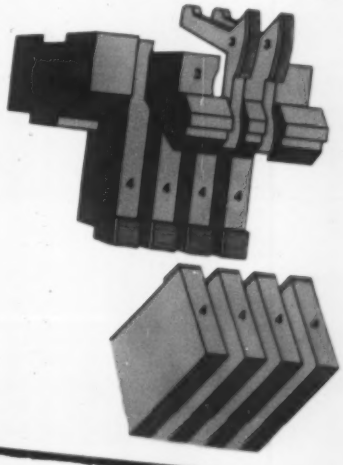


Here is the General Electric Type AK-1-50 Electrically Operated Air Circuit Breaker, 1600-ampere frame size used to protect low-voltage systems. The picture shows one pole of the contact, and in order to photograph it, the housing and the arc-quencher parts were removed. Note the Revere Extruded Shapes, and Rectangular Rod. There are three shapes, and one size of bar, all in copper, because copper has the highest electrical conductivity of all commercial metals.

If these shapes had to be "hogged" out of bar, they would be expensive, due to the machining time, and the scrap generated. While copper scrap is readily salable at good prices, it is costly from the machining standpoint. Extruded shapes by Revere, preformed to the desired contours, usually reduce machining to a cutting-off operation, plus such minor details as drilling which cannot be done during extrusion. Shapes naturally cost more per pound than bar or rod, but the ultimate saving makes up for the difference and more, sometimes several times.

Are you doing much machining of copper? If so, look into Revere Extruded Shapes. They may save money, and speed up production as well. See the nearest Revere Sales Office.

Sketch showing details of contacts. Nos. 1, 2 and 3 are extruded and drawn copper shapes. No. 4 is rectangular copper bar. Cross hatching represents special arcing contacts brazed to the copper.



REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

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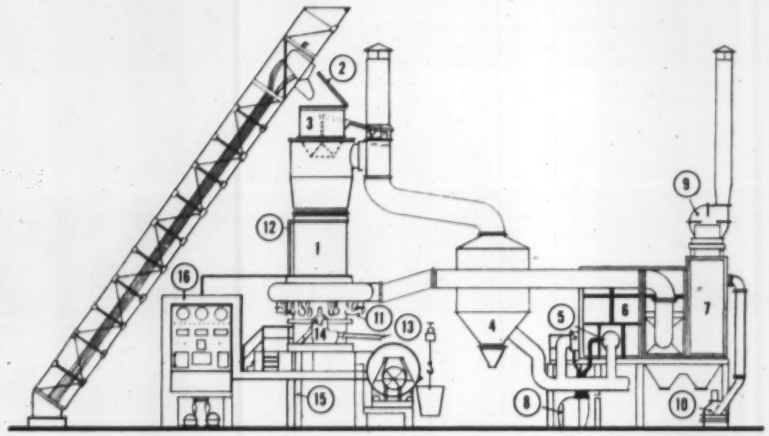


Operating Cycle

The cupola, (1) which has the appearance of a small blast furnace, is charged either by skip hoist or overhead traveling crane. Top cover (2) opens automatically when charge is dumped into the bell-sealed hopper (3).

Gases are collected at the top of the cupola, then passed through a primary gas cleaner (4). Further gas cleaning can be done if necessary. The gas burners (5) heat the combustion chamber (6) feeding the metallic-type air preheater (7) and use, for this purpose, 35 to 40 per cent of the top gases. Combination burners use either gas or fuel oil to start the plant.

Air for starting the plant with fuel oil is provided by a fan (8) while the exhaust fan (9) at the outlet of the preheater produces a slight negative pressure in the combustion chamber which carries flue gases away to the stack. The main blower (10) provides the necessary air through the preheater to the tuyeres (11) at 950 to 1000°F.

Metallic tubes of the air preheater are kept dust free by automatic shot blast cleaning which can be done while the plant is operating.

Water cooling (12) of the cupola shell is constantly taking place on the outside surface, and the copper tuyeres are conventionally watercooled.

In tapping, a continuous hot metal runner (13) delivers iron to a holding furnace. A continuous slagging spout (14) insures a constant volume of slag in the well. Molten slag is cooled in the shell-cooling water (15) and the granulated slag becomes a recuperable by-product.

The instrument panel (16) includes control of all factors involved. Air flow meters, pressure and suction indicators, control pyrometers, CO/CO_2 and H_2 analyzers and automatic regulating instruments are all centrally located.

Short Cut to Hot Metal

A COMBINATION of the best operating properties of the blast furnace and the cupola can convert ordinary steel scrap into high quality hot iron suitable for foundry or nonintegrated steel plant use.

It's called a metallurgical blast cupola by its designers, Compagnie Generale des Conduites d'Eau Les Vennes of Liege, Belgium. The exclusive rights to manufacture and market the furnace have just been granted the Barium Steel Corp. A unit has been producing successfully at the corporation's Central Iron & Steel Co. plant at Harrisburg, Pa.

Big Plus—The main asset of the furnace is its ability to produce molten iron from 100-per-cent steel scrap, and, because of the reducing conditions similar to those of the blast furnace, there is 100-per-cent metal yield. Content of the iron oxide in the slag is low which affects desulphurization within the unit itself.

Not only can a high quality iron be obtained from the scrap charge, but metallurgical control of both metal and slag can be achieved to a degree not possible with conventional cupolas. For instance, molten iron with high carbon content can be produced from all-steel scrap with the same ease that low carbon iron can be produced from high carbon charges.

Not Untried—There are 17 installations of the blast cupola in eight countries in Europe. The biggest unit to date is the one at Central Iron & Steel, which produces 20 tons an hour. While an installation is more costly than a standard cupola, total outlay is much less than that for a blast furnace. This development could become the low-cost hot metal producer that is needed for the furthering of the oxygen steelmaking process (STEEL, Apr. 4, p. 80).

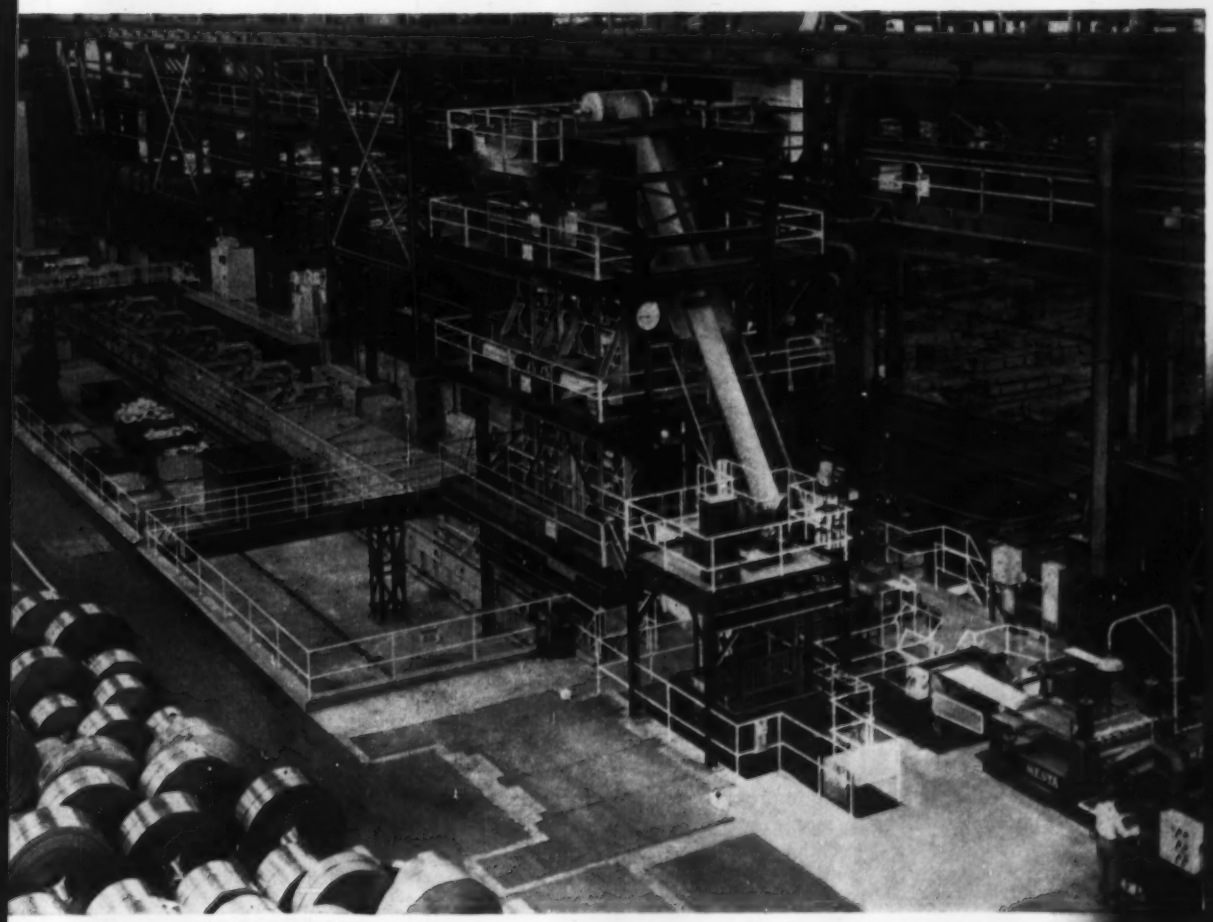
The process retains the low pressure blast and continuous tapping feature of the cupola while duplicating in a large measure the chemistry of blast furnace practice.

Sulphur content can be held less than 0.06 per cent, refractory wear is reported to be ½-lb for every ton of iron and metal temperature at the spout is about 2800°F.

Intermittent melting schedules can be maintained. Cupolas have been banked up to 40 hours without affecting the constant analysis of the metal when blowing was continued. Because of this feature, one blast cupola can replace two conventional cupolas, Barium officials maintain.

Continuous— galvanizing lines

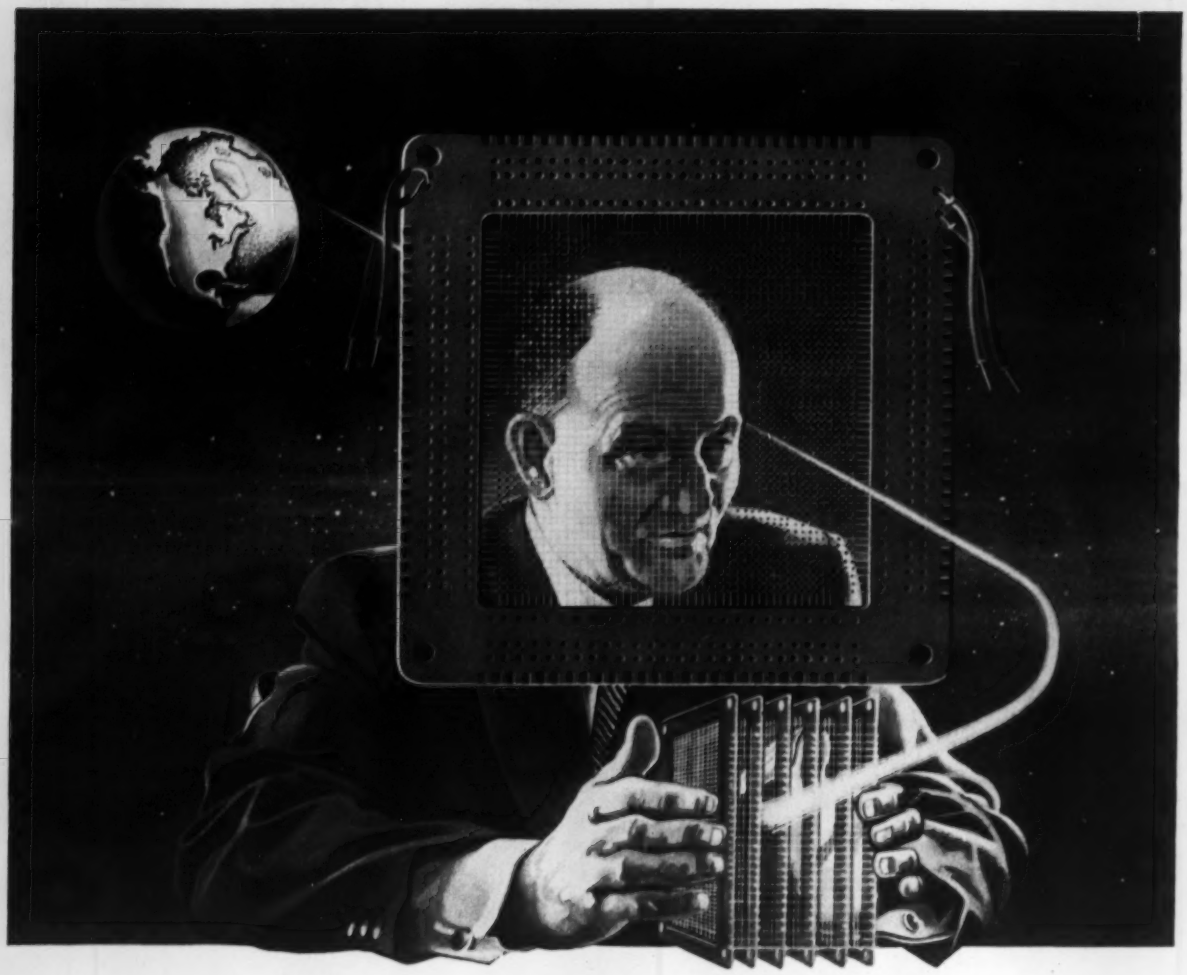
Designed and Built by MESTA



Mesta 48" Continuous Galvanizing Line

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA



What's New in Mnemonics?

It's the new Univac II—the finest business computing system ever developed. The famous Univac of Remington Rand is still the *only* completely self-checking system . . . the only one which can read, write, and compute simultaneously. And now Univac adds to these superior features the speed of a magnetic-core memory.

Remington Rand has pioneered in this important new development, installing, over a year ago, the first commercially available electronic computer to use magnetic-core storage successfully.

Mnemonics, says Webster, is "the art of improving the efficiency of the memory." And, in electronic computing, the new Univac II carries this art to a point far beyond its contemporaries.

With this new magnetic-core storage, the internal memory of the Univac has doubled, giving instantaneous access to 24,000 alphabetic or numeric characters. If needed, the capacity of Univac II can be further increased to 120,000 characters.

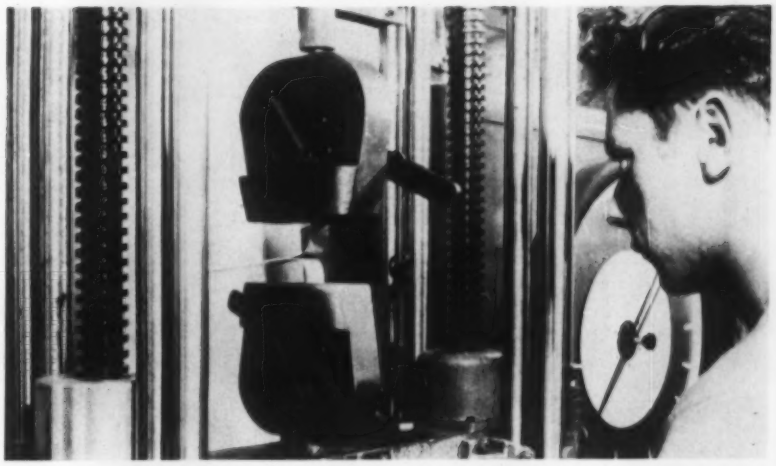
Univac's external memory—magnetic tape—now has greater capacity too, increasing input and output to 20,000 characters per second . . . the equivalent of reading or writing every character on this page more than 1,000 times a minute.

These new Remington Rand developments can be incorporated into any existing Univac installation to double its speed of operation and increase its economy still further. For additional details, write to . . .

Remington Rand

ELECTRONIC COMPUTER DEPARTMENT, ROOM 1650, 315 FOURTH AVENUE, NEW YORK 10, NEW YORK

A new test being used at Douglas Aircraft determines the average peel strength of metal bonding adhesives. Added benefit is the type and relative magnitude of adhesive failure



They're Pulling for Better Bonds

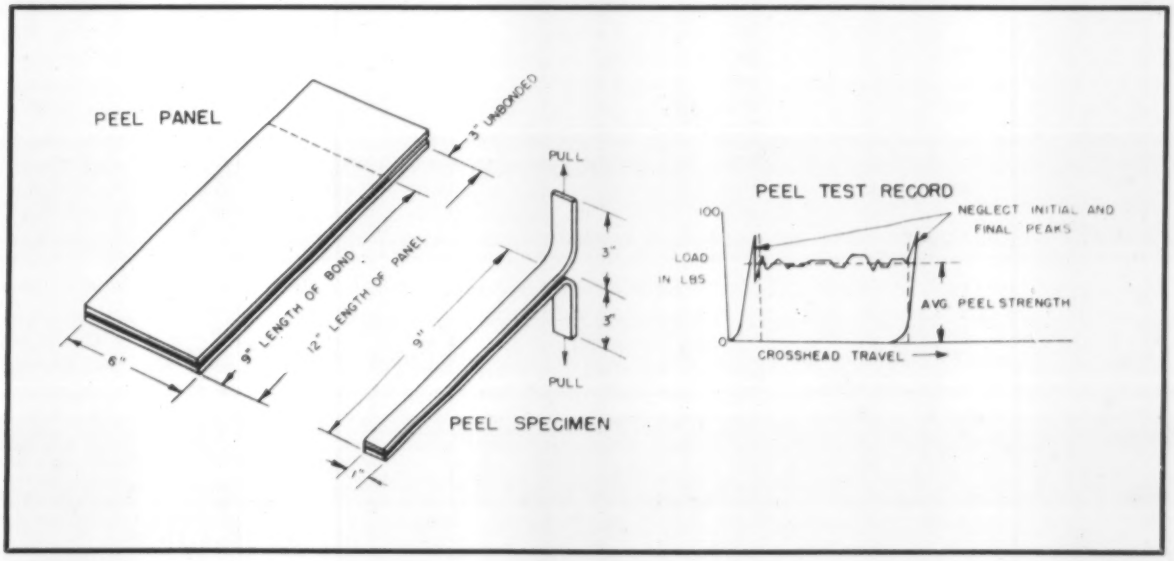
METAL - TO - METAL adhesives hold a lot of promise for the fabrication of aircraft structures. At Douglas Aircraft Co., Santa Monica, Calif., they're learning more about these materials by pulling apart bonded strips.

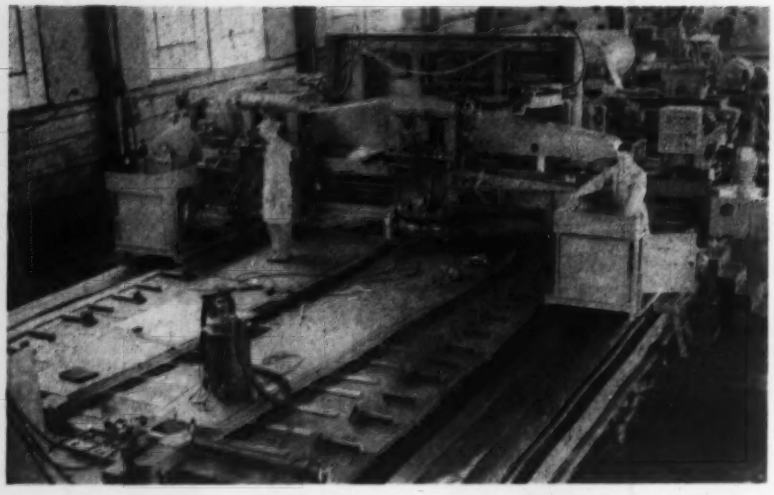
Adhesives to be tested are applied to 0.032 gage, clad 24ST3 aluminum alloy. Test specimens are prepared as shown in the drawing. Before tensile testing, a report of the bonding details is prepared, showing all data pertinent to the test.

Procedure—During the test, the unbonded ends of the test panel are gripped in the jaws of a 5000-lb, universal testing machine made by Baldwin-Lima-Hamilton Corp. The specimen is pulled apart at the rate of 1 ft a minute. The autographic machine records load versus crosshead motion.

Technicians estimate average peel strength in pounds per inch width of specimen from the test record. High peaks at the initial and final portions of the curve are not considered because they are characteristics of the test and not properties of the adhesive.

Average adhesive film thickness and type of failure also are recorded. Failures include: 1. Adhesive failure between metal and adhesive or primer. 2. Bubbles or porosity. 3. Cohesive failure within the adhesive. 4. Dow film failure. 5. Metal failure. 6. Primer failure between surfaces of adhesive primer and tape. 7. Unbonded areas as a result of trapped gases or lack of pressure which prevented contact between metal and adhesive.





To keep up with F-100-D wing production . . .

Skin Mill Aims at Speedier Cuts

UNUSUAL REQUIREMENTS of the aircraft companies are blowing up a brisk breeze in the doldrums of machinery rebuilding. Typical example: The skin mill soon to be shipped from Simmons Machine Tool Co., Albany, N. Y., to North American Aviation Co., Los Angeles.

The mill, which started 15 years ago as a Betts pit planer, was discovered languishing in Buffalo. North American had acquired a similar planer from government surplus and converted it for milling aircraft wing skins. The Simmons conversion is an exact copy. It will be used to mill skins for fighter aircraft wings.

On the Fly—Producing these integrally stiffened skins is tricky. Depth and angle of cut have to be constantly varied. Accuracy is paramount. It's slow work at best, and the new mills are aimed at speeding it.

North American representatives say the Simmons mill is capable of carving out skins faster than it ever has been done before. For one thing, it works on two skins at once. It is designed for automatic, semiautomatic or manual operation.

In the Pit—Salvaged from the Betts planer were the rails and gantry. Practically everything else is new, but by starting with these ready-made castings, the mill was built at a saving of about two-thirds in time and cost compared with a machine built from scratch.

Where the planer pit was, there's a new plate bed on which are mounted two pivoted air chucks. These hold the 1¾-in. aluminum plates that will become the skins. Two cutter heads and the control stations ride the gantry.

Mixed Motions — Sets of templates mounted along the edge of the bed control up-and-down motion of the cutters. Rotational motion of the chucks and positioning of the cutters are controlled through stepping switches. An index bar on the gantry, linked to limit switches, accomplishes micrometer adjustment of the cutters.

Two 60-hp motors drive the two-bladed fly cutters at 3600 rpm. Speed is held constant regardless of load conditions or rate of gantry travel. The main control motor has a 55 to 1 speed variation, with top speed about 1200 rpm. Electronic motor controls are mounted in cabinets off the machine.

North American will put the mill to work on wings for the F-100-D. On these 25-ft skins, several of the long cuts fan out instead of being parallel. This is the reason for the pivoted chucks, which can swing the skins so that all long cuts can be taken parallel to the ways.

Greater Press Safety

If your press clutch works by air, here's a valve to doubly guard the operator

NO MATTER how accident proof builders make presses—and today's are safety wonders—users always will want greater safety.

Good news for the safety minded is a protector valve for presses with air-operated clutches or brakes which provides five safeguards in one. It is designed for operation with the antirepeat control that Clark Controller Co., Cleveland, maker of the new valve, developed several years ago.

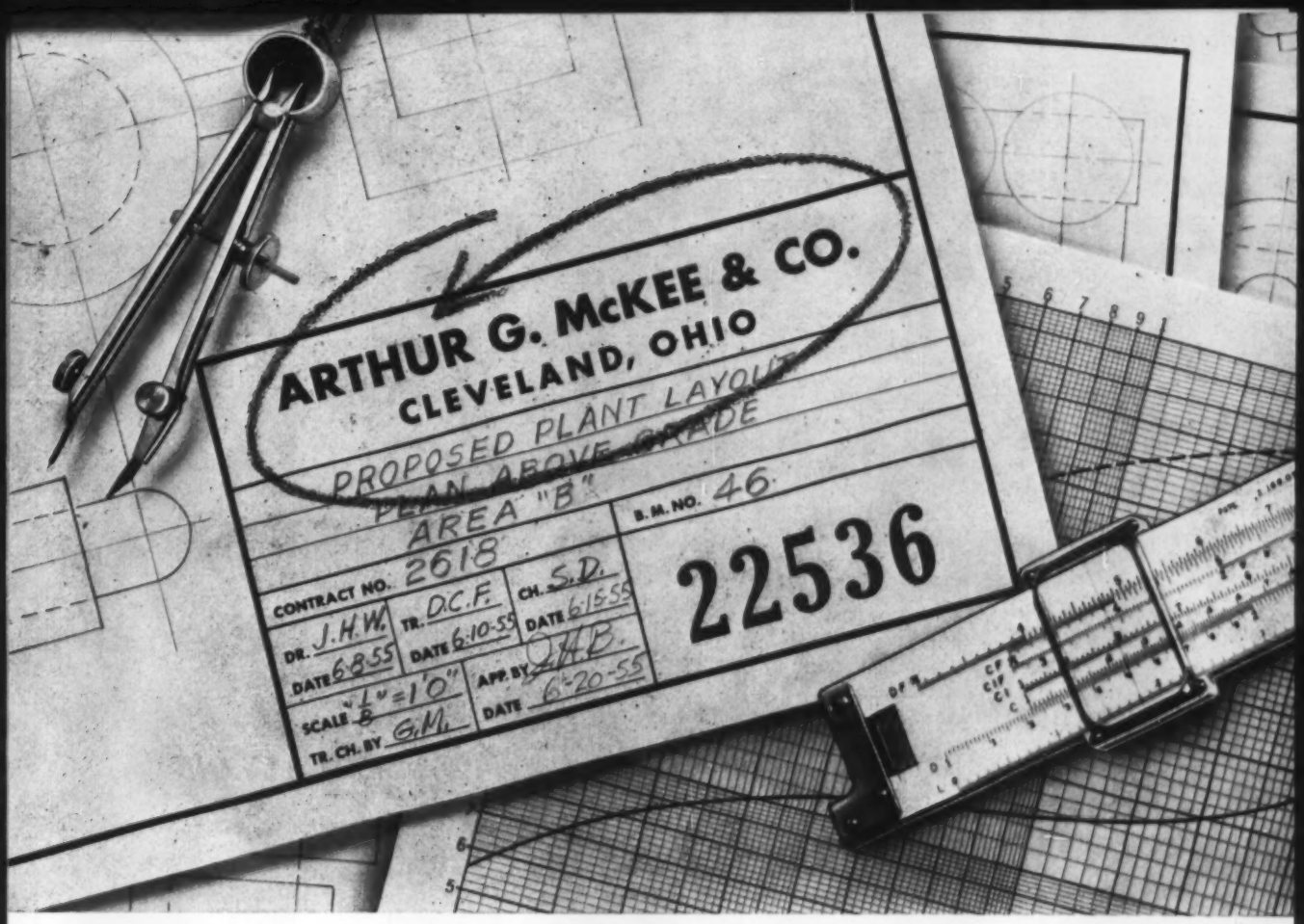
Both Hands—If the press operator does not have both hands on pushbuttons, the valve will not pass air to the clutch. If he has the poor sense to jam the pushbuttons, the valve backs up the electrical antirepeat circuit and prevents a second press stroke until the pushbuttons are released and again pressed.

If the electrical mechanism operating the main valve fails, a "permissive" valve closes, preventing air from reaching the main valve. If foreign matter jams the main valve open, the permissive valve closes the same way. In addition, a safety "verifier" valve monitors the state of the permissive valve, and shuts down the air system if the permissive valve should fail.

War on Wear—Mechanical motion of two relays is necessary to position the valve parts, but Clark has been trying for two years to get the slight mechanical wear-and-tear out of the antirepeat relays. Transistors turned out to be the answer.

Not in production, but undergoing field testing, is a transistorized antirepeat control. It makes a smaller package than the magnetic control (important to press builders who must install so much accessory equipment in the press columns), and has no moving parts to wear out.

It operates on 20 volts. "You can't buy one today," said a Clark spokesman, "but tomorrow, we hope. So far as we know, we are the first to apply transistors to this type application."



THE BEST NAME YOU CAN GET
on the engineering of your new plant

● Compared to the cost of material and construction, the engineering of your new plant represents a small percentage of your investment. Yet the erected value of your plant depends largely on the quality, accuracy and thoroughness of the engineering.

Here at McKee we know from sound, practical experience—a full half-century of it—that meticulous care in engineering pays off in reducing construction man-hours and in making most advantageous use of materials. But, most of all, McKee engineering assures you *correct* plant design and efficient layout—in short, a plant designed and built to earn a profit. When you want the best name you can get on your plant engineering, call in McKee.

50th ANNIVERSARY

McKee Engineering Services

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This line has less corrosion-caused down time because . . .

Trouble Spots Are Designed Out

MULTISTAGE continuous pickling machines can turn out the volume—that is, when they're not down for maintenance or repair of corrosion damage. Cutting these down time costs is the ever-present challenge.

One of the best places to start is at the design stage. The Maytag Co., Newton, Iowa, points to its new line as proof. Some 200 ft long, 10 ft wide and 15 ft high, this machine was built and installed by R. C. Mahon, Detroit. It pickles and cleans appliance parts before they are porcelain enameled.

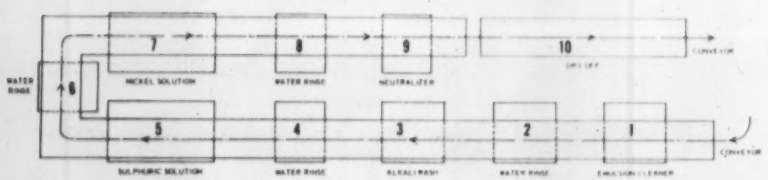
Handling First — Carrying the parts through the ten stages is an exterior monorail conveyor which is protected from steam and acid fumes by a Mahon-designed water seal. This system of retaining vapors also keeps considerable heat and condensation from getting into the plant. The conveyor has work hooks on 24-in. centers and moves at about 6 fpm.

First step is a 1-minute, 150°F emulsion wash and a water rinse, followed by a ½-minute spray with unheated water. Next comes the alkali wash and water rinse at 150°F. The housings for these three stages are of 10-gage mild steel, and the tanks are constructed of 3/16 and ¼-in. mild steel plate. The fourth stage is another ½-minute unheated water rinse. This tank and housing are made of 14-gage black iron.

Acid Problems—The fifth stage—sulphuric acid bath for 4 minutes at 150°F, with a water flush—was the trouble spot.

Maytag tried Carpenter 20-Cb. This columbium-stabilized stainless

Schematic Drawing of the Maytag Line



Three cheers for the red, white and cool

The "see-through" safety guard was specially made for this photo only.

Distinctive RED blotter on a new WHITE wheel is the sign of COOL tool grinding worth cheering about! And that's not all...V40 Bond Tool Room Wheels by CARBORUNDUM cut faster, last longer and permit heavier infeeds without burning the stock or overheating the tool, even on die steels and hi-vanadium types. And the outstanding form-holding ability of V40 Bond Wheels eliminates costly stops for wheel dressing halfway through a job. Try one in your shop today. There's a type for every tool room operation...easily identified by the V40 on the bright red blotter. Your CARBORUNDUM Distributor or salesman will arrange a free demonstration. For Bulletin A-1310, write The Carborundum Company, Niagara Falls, New York. In Canada: Canadian Carborundum Company, Ltd., Niagara Falls, Ontario.

Through product quality and application "know-how"

CARBORUNDUM

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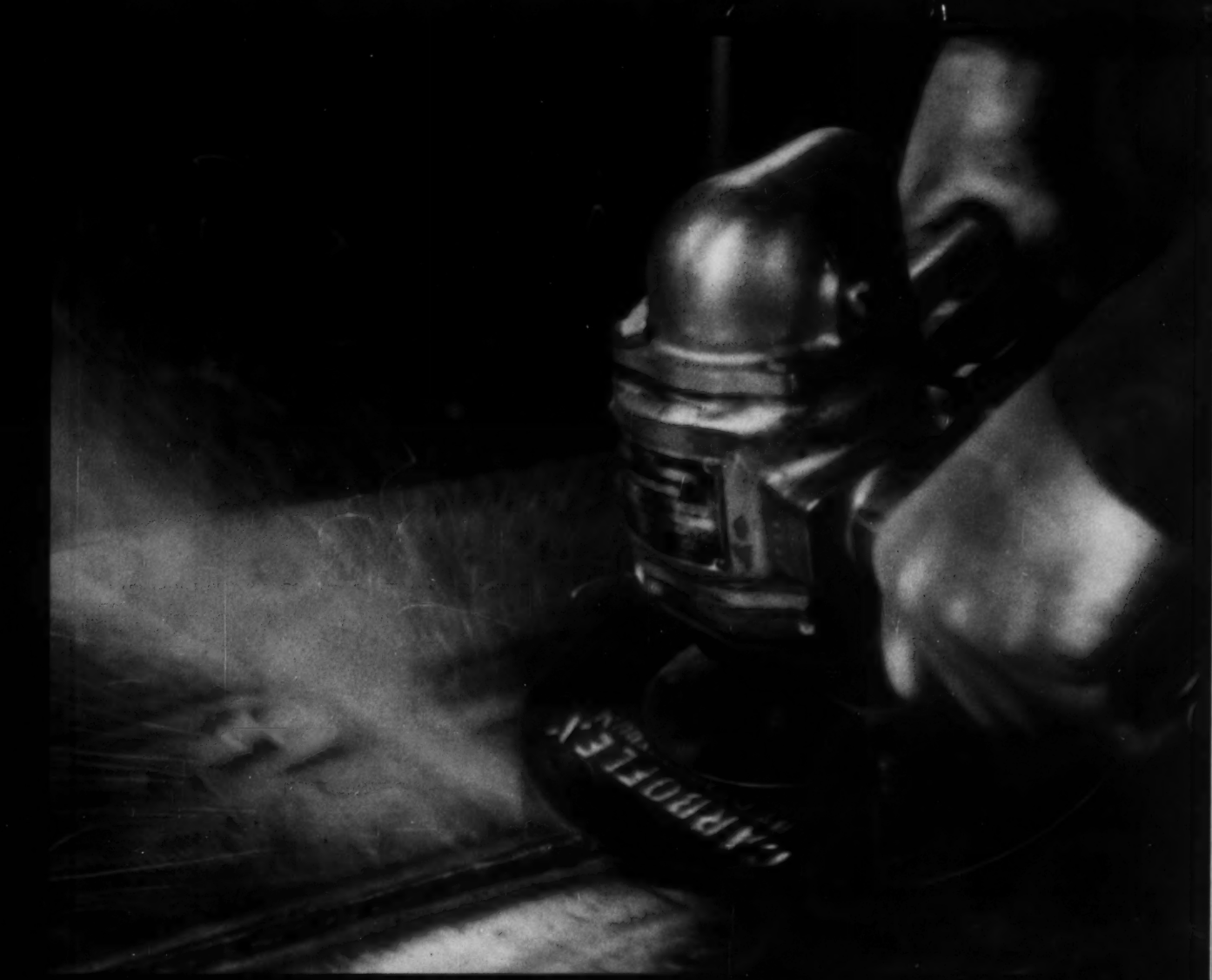
continually puts more sense in your abrasive dollar



All work and some play makes this a smart buy

6,000-r.p.m. wheel speed is "stopped" by 1/10,000 sec. stroboscopic exposure. (The "see-through" safety guard was specially made for this photo only.)

Here's the perfect answer to all rough grinding problems. CARBOFLEX Depressed Center Wheels, with resilient fibre-reinforced construction, combine maximum cutting ability with maximum operator safety. Reduce or undercut heavy welds, clean up castings, rough off fins and sharp risers...in record time, at less abrasive cost per wheel. CARBOFLEX Wheels are tops for cutting-off and slotting, too! Another outstanding feature: the back of the wheel, like its face, is knurled. You can cut with either side, plus the edge... without initial dressing. Call your CARBORUNDUM Distributor or salesman today for a demonstration of this rugged production booster. For descriptive folder A-1272, write The Carborundum Company, Niagara Falls, New York. In Canada: Canadian Carborundum Co., Ltd., Niagara Falls, Ontario.

Through application "know-how" and product quality

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alloy stands up under sulphuric acid attack and was readily weldable without carbide precipitation troubles.

This particular tank is 20 ft long, 9 ft wide and 4½-ft deep. A black iron frame supports the 14-gage welded tank. The No. 20 alloy also is used for the heating coils which stand vertically in the tank, completely submerged in the 10-per-cent hot acid solution. To this tank is connected a 300-gpm, Durimet-20 pump which forces the acid through a carbon pipe and then into the carbon spraying system. Durimet 20 is the cast form of Carpenter 20. Both are patented by Duriron Co. Inc.

Moving On—Then the line passes through a 1-minute unheated water rinse. This tank and housing are made of sheet iron and are rubber lined. Monel metal was used for the tank and housing of the next section, where a 4-minute treatment with nickel sulphate solution and a water flush bathe the parts.

After a caustic rinse for 80 seconds at 180°F, comes an 80-second neutral rinse. Both these stages have 10-gage mild steel housings and tanks of ¼ and 3/16-in. mild steel. Now the parts are ready for their trip through the 30-ft drying oven.

Service Features—All tanks are equipped with double screens, overflow gutters and rain connections.

Standard piping and iron nozzles are used in all but the pre-acid and post-acid water rinses and the nickel sulphate stage. They are served by Type-347 stainless piping with stainless steel nozzles.

Separate pumps with capacities ranging from 150 to 725 gpm circulate the solutions used with each stage of the machine. An exhaust fan mounted on a structural steel platform above the machine draws from dampered exhaust outlets on the entry and exit vestibules. The sulphuric acid stage, however, has independent exhausts and a scrubber made of Type-347 stainless steel. This scrubber draws from outlets at each end of its respective spray zone and completely neutralizes the acid fumes before releasing them into the atmosphere.

Make high-strength aluminum castings without heat treatment!

Foundries without heat treating facilities are producing high-strength aluminum castings with Federated's Tenzaloy. Mechanical properties are equivalent or superior to the common heat-treated alloys, and impact strength is greater.

Tenzaloy, a product of Federated research, is a self-aging alloy of the aluminum-zinc-magnesium type. It reaches full strength after a few days aging at room temperature. No special casting precautions or facilities are required.

Tenzaloy castings have excellent machinability. They can be anodized to a superior white color. Tenzaloy is one of the few casting alloys that can be brazed at high temperature. It has corrosion resistance equal to or better than the aluminum-silicon alloys.

If your heat treating facilities are inadequate or too costly, or if you are paying for outside work, or if you are casting large and complex aluminum shapes which cannot be conveniently heat treated, call Federated for more information on modern Tenzaloy. Any of our 13 plants and 23 sales offices across the country is ready to help.

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Inside the camera, brass powder parts

Brass Powder Catches Up

By G. L. WERLEY
The New Jersey Zinc Co. (of Pa.)
Palmerton, Pa.

THIS IS THE shutter mechanism of the Polaroid Land camera. The circled, light-colored lever could be a machined extrusion, a precision casting or a diecasting, but it isn't. It's a brass powder part.

Powder metallurgy proved the most economical way to make it. The part is molded to such close dimensions that no secondary machining or coining is needed. It has the same qualities that endear wrought brass to the camera maker: Corrosion resistance, adequate strength (tensile 25,000 psi) and excellent bearing properties.

It is a good example of how brass, a late starter in powder metallurgy, is catching up.

After Fuses—During the Korean conflict, 100-million brass powder rotors were used in artillery fuses, with estimated savings to the government of $10 million dollars. Know-how gained on those parts helped solve the early difficulties of brass powder fabrication.

Now brass powder is a civilian, looking for a job.

The chart (right) points out some characteristics of parts well suited to brass powder production and some types of work to avoid. Undercuts, such as annular grooves and screw threads and flanges at both ends of a part, are possible, but they make parts difficult to remove from the die. This is where the easy machinability of brass, especially leaded brass, enters the picture. After sintering, machining operations such as drilling and tapping, can be performed economically.

How Big?—Recommended size range for brass compacts runs from 0.03-in. minimum diameter to 4 in. maximum. Sintering temperatures should be about 1600°F. Production speed is largely limited by the type of press used. Some will turn out 6000 compacts an hour.

Prealloyed leaded brass is the powder most widely used. During sintering it shrinks uniformly, which makes accurate die design possible.

Physical and mechanical properties resemble those of brass castings. Strength, hardness and wear resistance are close to those of dead soft annealed brass, but wrought brass properties can be approached by repressing.

Profitable Parts—One successful application is for lock cylinders formerly produced by sand casting.

Guide for Brass Powder Design

Easy To Press:

- Cylindrical, rectangular or irregular shapes
- Parts with indentations on top and bottom projections
- Parts with simple flanges
- Parts with splines, gear teeth or knurling
- Parts with holes, counterbores, slots or keyways

Hard To Press:

- Narrow or deep splines
- Feather edges
- Sharp corners
- Undercuts
- Flanges on both ends of a part

Typical Properties of Brass Powder Parts

Under your telephone dial, brass powder weights and drive bar (left)

	Nonleaded Brasses				Leaded Brasses	
Composition: (per cent)						
Cu	70.00	70.00	85.00	90.00	78.50	78.50
Pb					1.50	1.50
P		.30				.25
Zn	30.00	29.70	15.00	10.00	20.00	19.75
Optimum sintering temperature, °F	1615.00	1545.00	1615.00	1615.00	1615.00	1615.00
Range of sintered density, grams per cu cm	7.3–7.6	7.3–7.6	7.6–7.9	7.6–7.9	7.5–7.8	7.5–7.8
Compacting pressure, psi	60,000.00	56,000.00	56,000.00	58,000.00	56,000.00	62,000.00
Tensile strength, psi	26,800.00	31,500.00	26,800.00	22,200.00	27,400.00	28,800.00
Elongation, per cent	8.00	37.00	12.00	10.00	12.00	24.00
Rockwell hardness	80.00	68.00	74.00	65.00	81.00	71.00
Density as compressed, grams per cu cm	7.16	7.03	7.51	7.58	7.37	7.41
Sintering change in length, per cent	−1.96	−2.58	−1.27	−0.83	−1.70	−1.65
Sintering change in weight, per cent	−1.94	−1.41	−1.11	−1.02	−1.39	−1.20

On one job secondary operations were reduced from 23 to 11 with a 35 per cent saving in man-hours. (See below.) Leaded brass powder made machining easy. Additional economies came through fewer rejects and reduced tool breakage.

Brass powder is used for the governor weights and drive bar in the dial mechanism of telephone handsets made by Western Electric Co. The parts are used without machining, which means that dimensional tolerances have to be tight.

A gear and cam hub for another application could have been machined economically from bar stock, except for a protruding key and a notch designed into them. As pressed from brass powder, the parts required no machining. Redesign would have been necessary to make another production method pay.

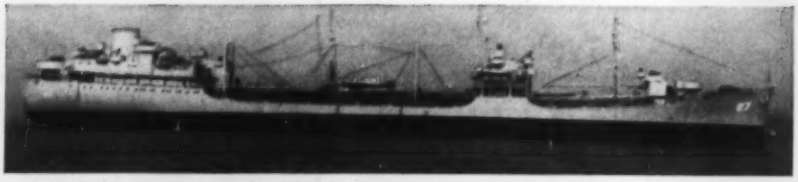
Brass Powder Saves on a Lock Cylinder

In parentheses below, operations eliminated through powder production

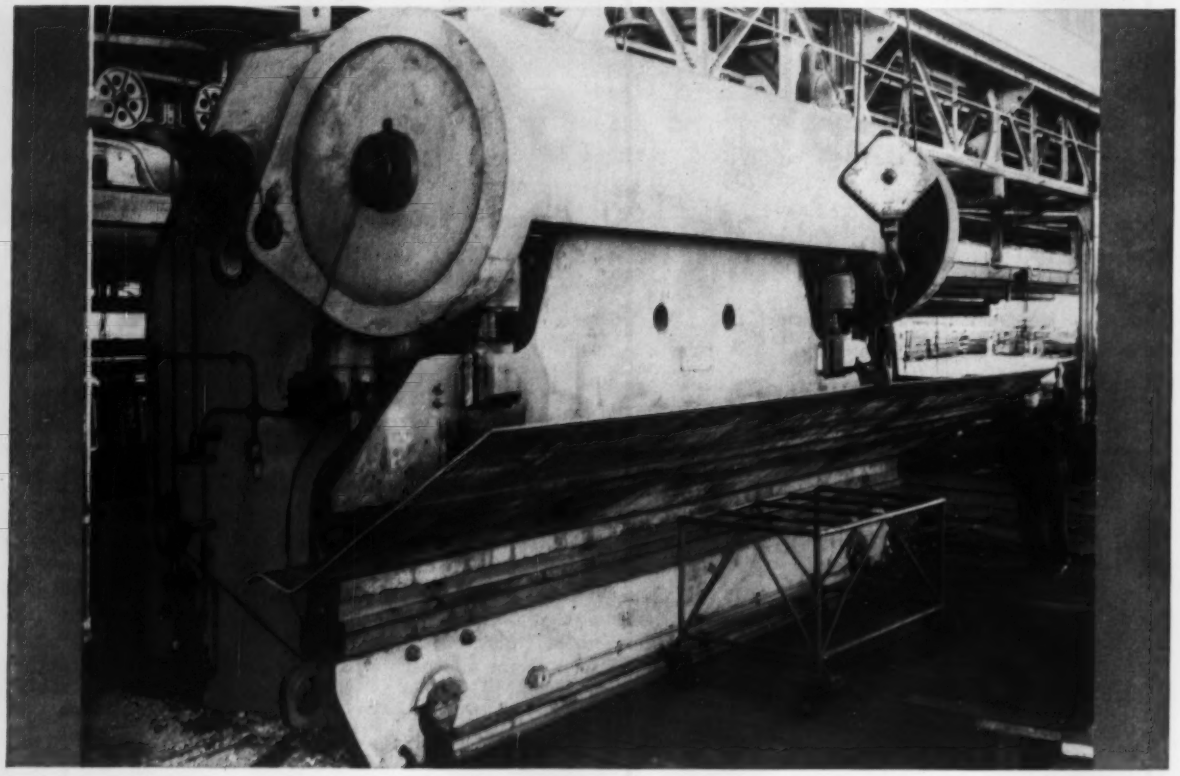
1. Make cores
2. Mold
(3. Chop off)
(4. Grind face and back)
(5. Rough-ream plug hole and rough cut to length)
(6. First-ream plug hole)
(7. Rough bevel)
(8. Rough face)
(9. Counterbore plug seat)
(10. Mill for spot and bar cut)
11. Drill pin holes
12. Ream plug hole
13. Drill, countersink and tap two ear holes
14. Ream pin holes
15. Ream plug hole
16. Disc pin holes
17. Stake pin holes
(18. Finish-ream plug hole)
(19. Clean counterbore for plug seat)
20. Broach for mushroom drivers
21. Finish cut to length
(22. Finish face, turn outside diameter and bevel)
23. Finish ream and counterbore
24. Polish
(25. Stamp name)

Courtesy ASME

U.S.S. KASKASKIA is typical of many ships which have had extensive bulkhead and other repairs at Moore Dry Dock Company.
Official U. S. Navy Photograph



Moore Dry Dock SPEEDS MARINE REPAIRS



Fluted bulkhead plate being formed by Steelweld bending press in plate shop of Moore Dry Dock Company for bulkhead renewal job on U.S.S. "KASKASKIA" (A027). Size of plate: length 26', width 6', thickness ½".

Long a leading West Coast ship builder and marine repairs concern, the Moore Dry Dock Company, Oakland, California, has found a large Steelweld Bending Press to be a great asset in speeding the forming of heavy plate.

Ship repair, which constitutes an important part of the company's business, often requires replacement of large sections, such as bulkheads. This necessitates the forming of plates to various shapes to accurately replace those removed. Because of the power of their Steelweld and the ease of making adjustments, this work is carried on efficiently and satisfactorily.

The entire line of Steelwelds has an enviable reputation for continuous high-production performance. We urge you to get the facts on their many outstanding features.

GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7862 East 281st Street, Wickliffe, Ohio

STEELWELD

BENDING PRESSES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

Screw Machine Delivers Higher Production Speeds

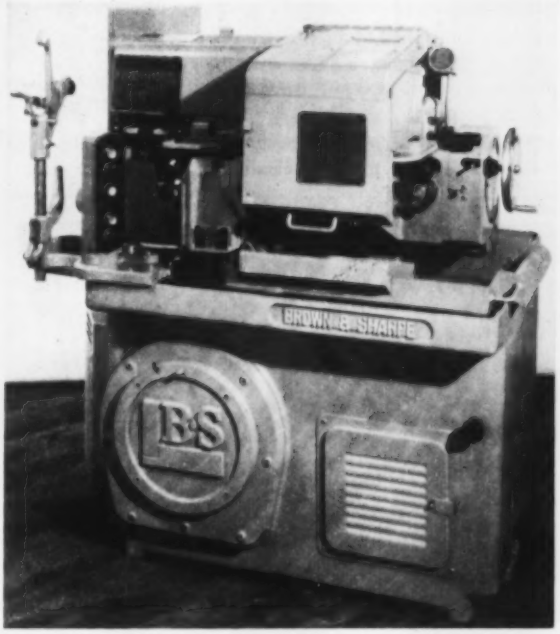
A top spindle speed of 7200 rpm makes the No. 00 the fastest automatic in its range. This means increased production on all materials from free-cutting plastics to tough alloy steels. The unit takes stock up to ½-in. in diameter and has a 1-in. turning length—or 1½-in. with special equipment. (For a job study see page 113.)

Cross-slides and detachable ways of hardened ground steel, precision ball bearings in spindle and sprockets and fully automatic lubrication reduce maintenance problems. The vertical slide is standard equipment, permitting an additional tool position.

Spindle speeds range from 34 to 7200 rpm, with 208 combinations of high and low speeds in ratios from 2.3:1 to 16:1. Selection of speed and direction is made by pick-off gears. The positive chain drive of the spindle at all speeds assures adequate power throughout the full speed range.

Pushbuttons control both spindle and driveshaft. A driveshaft jog button is provided for setting up. The speed of the driveshaft (either 240 or 120 rpm), which drives all the automatic mechanisms, is changed by transposing two pick-off gears. A safety device prevents rotation in the wrong direction. Eleven change gears give the complete range of 120 production rates from ¾ to 100 seconds a piece.

Convenience and safety features: The driveshaft handwheel does not rotate when the machine is in operation and moves out of the way with the compartment door when the gears are changed. The turret slide has a hand lever for setting up. The coolant supply is constant at both driveshaft speeds. The chip tray is easily removed. Electrical controls conform to J.I.C. standards.



In addition to the attachments available for previous Brown & Sharpe automatics, two new ones have been added for the No. 00: The skip indexing attachment gives increased production on deep drilling operations. A brake in neutral attachment permits the use of both high and low speeds on those jobs where provision must be made to stop the spindle automatically. *Write*: Dept. 43, Brown & Sharpe Mfg. Co., Providence, R. I. *Phone*: Dexter 1-5000

Saw Band Features Improved Tooth Design

The Demon Claw Tooth band combines the characteristics of high-speed steel with positive rake teeth. It penetrates easily with less feed pressure. This makes possible the accurate slotting of heavy steel parts (illustrated). Cutting speed and tool life also are boosted.

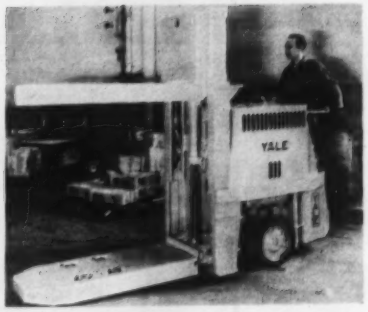
The band retains its high tooth hardness at temperatures to 1050° F and can be run at speeds several times that of carbon steel tools. Its springlike hardness allows heavier work feeds and chip loads.

In performance tests, this band cut 48 per cent faster than a zero-rake, skip-tooth blade, using the same feed pressure. At equal cutting rates, the claw tooth required 39 per cent less feed pressure.

The product is available in four widths from ¼ through 1 in. and in four pitches, 2, 3, 4 and 6 teeth to the inch. *Write*: DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill. *Phone*: Vanderbilt 4-1122

NEW PRODUCTS and equipment

Dual Lift Truck

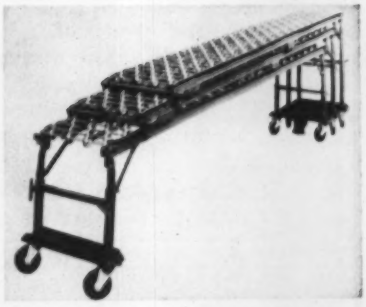


Skid handling is doubly quick with this 4000-lb platform truck which can transport two skids simultaneously. The hydraulic electric unit has two independently operating platforms which can be separated to a maximum vertical distance of 62 in.

The upper platform fits over the lower one in its lowered position, giving the appearance of a single platform lift truck. *Write*: Yale Materials Handling Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. *Phone*: Orchard 3-1200

Telescoping Conveyors

Designed for loading and unloading trucks, boxcars or for general warehouse use, these units have 10, 12, 16 or 20 wheels per foot. They consist of two, three or four, 5 or 10-ft sections in 10 or 16 in. widths.

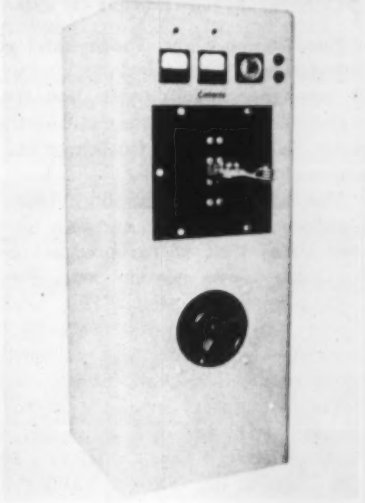


Elevation at the low end of the line is 2 ft. A complete unit of four 10-ft sections will be 3 ft 8 in. high at the high end. This unit is 12 ft 6 in. long when retracted and will extend to 40 ft. *Write*: Mathews Conveyer Co., Elwood City, Pa. *Phone*: Elwood City 1100

Induction Heating Unit

The Model LI-3 is a 3-kw, high-frequency unit for brazing, soldering, hardening and other light heat treating applications. Thermal output is 170 Btu a minute at a frequency of 400 kc.

Auxiliary work handling equipment is available to meet the re-

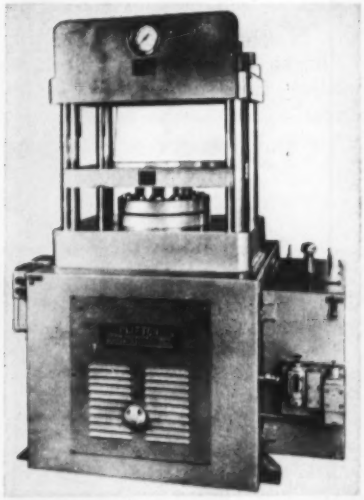


ARDCOR 1½-F ROLL FORMING MACHINE with two 30-TON ARDCOR PRESSES performing pre-notching and cut-off operations
Roll Forming equipment completely designed, engineered and manufactured by one highly experienced source.
RESULTS: ARDCOR integrated "Package" Installations consistently prove this advantage with precision forming at modern high speeds—better roll formed products! Consultation without obligation.
ARDCOR ROLL FORMING MACHINES
American ROLLER DIE CORP., 29520 Clayton Avenue, Wickliffe, Ohio
DESIGNERS AND MANUFACTURERS: All Sizes and Spindle Diameters of Roll Forming Machines, Welded and Lock Seam Tube Mills • Forming Rolls, Tubing and Pipe Rolls • Straightening, Pinch and Leveller Rolls • Cut-off Machines
ARDCOR Engineered
BEARS BETTER COLD ROLL FORMING

quirements for a number of uses. *Write*: Lindberg Engineering Co., 2450 W. Hubbard St., Chicago 12, Ill. *Phone*: Monroe 6-3443

Hydraulic Press

The Model 3A, a self-contained, all-purpose press, is designed to meet the problem of heavy production schedules. It is equipped with a Unitrol unit, developed to eliminate piping and provide single control.

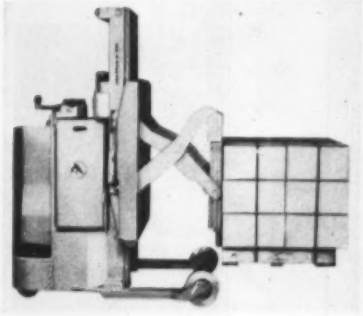


It is available in capacities of 50, 100, 150 and 300 tons. *Write*: Clifton Hydraulic Press Co., 288 Allwood Rd., Clifton, N. J. *Phone*: Prescott 8-3474

Electric Tiering Truck

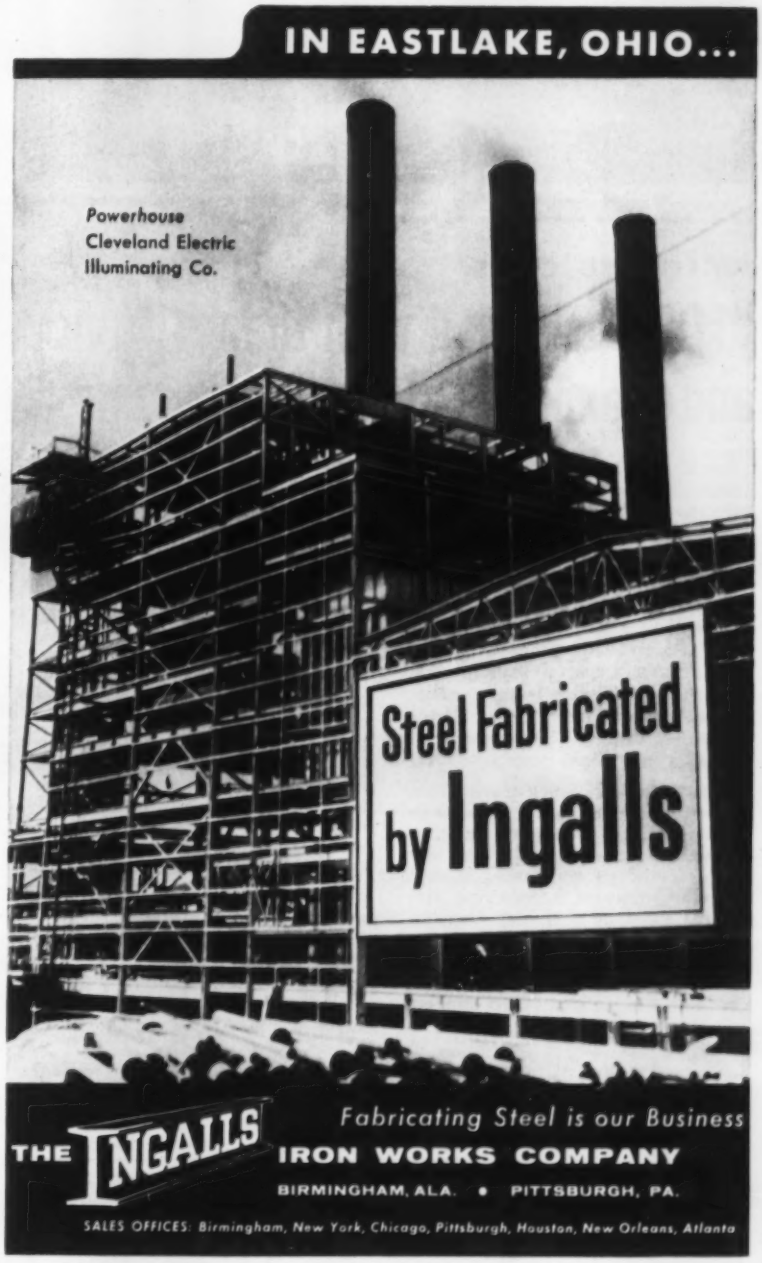
The ReachMaster is equipped with hydraulically extendable forks. To pick up, the truck is positioned before the load and the forks are extended into the pallet. The pallet and load are raised over the wheels and retracted into the truck. To tier the load, the operator reverses the procedure.

This unit has a capacity of 2000 lb and can handle loads up to 48 in. long. *Write*: Dept. R-18, Lewis-Shepard Products Inc., Watertown, Mass. *Phone*: 4-5400

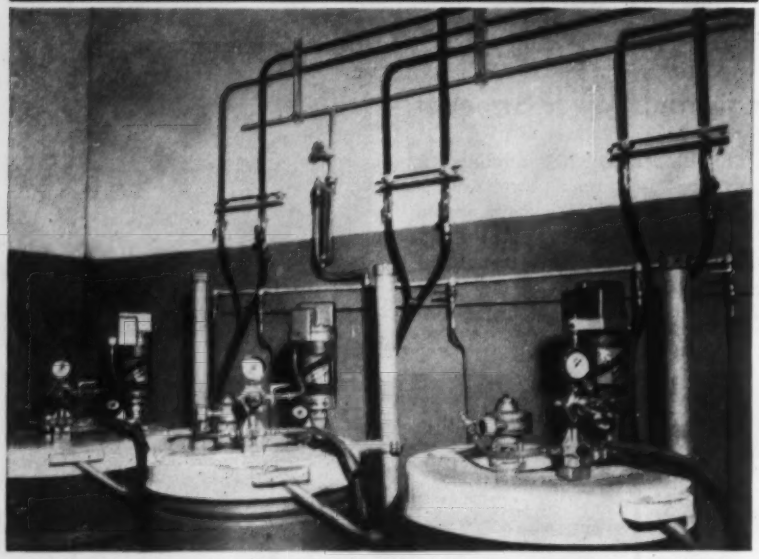


Industrial Power Sweeper

This model, which is available in three sizes, features a power reverse and 16 brushes on the main broom. Powered by a 3.6-hp Clinton engine, it has heavy-duty, semipneumatic front casters with a 1-in.-diameter stem. The main broom and



WHAT'S NEW in material handling pumps



Finishing of wood products made by Mullen Mfg. Co. is faster since they installed these three Binks all-new Material Handling Pumps.

MULLEN MFG. CO. IS

"100% pleased with the efficiency and economies of new Binks pumps"

The Mullen Mfg. Co. of San Francisco makes architectural woodwork for banks, offices and churches, fixtures for big chain stores, and other specialized wood products. Recently Mullen installed a paint circulating system using three of Binks latest Material Handling Pumps. Each pump circulates a different material through 200 feet of piping to supply spray guns, in two separate spray areas. Here's why the firm is "100% pleased" with its new Binks pumps:

President B. J. Nordstrand: Fire hazard reduced and expensive paint spillage eliminated because materials are pumped from the original 55-gallon drum. Costly handling time in transferring materials have been saved. And finishing is faster and more uniform because these pumps deliver lacquer sealer, flat lacquer or varnish on both the up and down strokes.

General Supt. Max Fuller: The finish on every article in an order is identical because each gun is supplied from the same drum...is constantly agitated and circulated. When a drum runs out, it's only a matter of a few minutes to make a change. The air operated pump lift raises the entire pump assembly, a new drum is placed in position, the pump is lowered and work recommences without delays. There are no tanks, extra hose, or other paraphernalia to clutter up the finishing department. Precision manufacture reduces pump wear to a minimum...no lubrication necessary.

FOR FURTHER INFORMATION

on these new pumps... see your local Binks Representative or write direct to the address below for a free copy of Bulletin 701.

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EVERYTHING FOR SPRAY PAINTING

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NEW PRODUCTS and equipment

side brush height control is on the steering bar.

It will sweep up to 45,000 sq ft an hour. *Write*: Modern Power Sweeper Co., 738 N. McKeever Ave., Azuza, Calif. *Phone*: Edgewood 4-6015

Dry-Chemical Fire Extinguisher

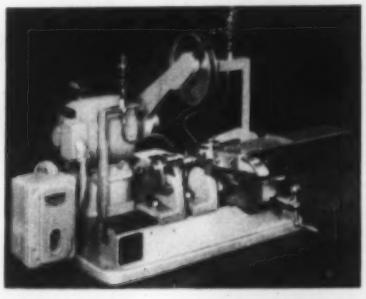
Carrying Underwriters' approval for a pressure range of 150 to 250 lb, it has extinguished 40-sq-ft gasoline fires at both pressure ranges.

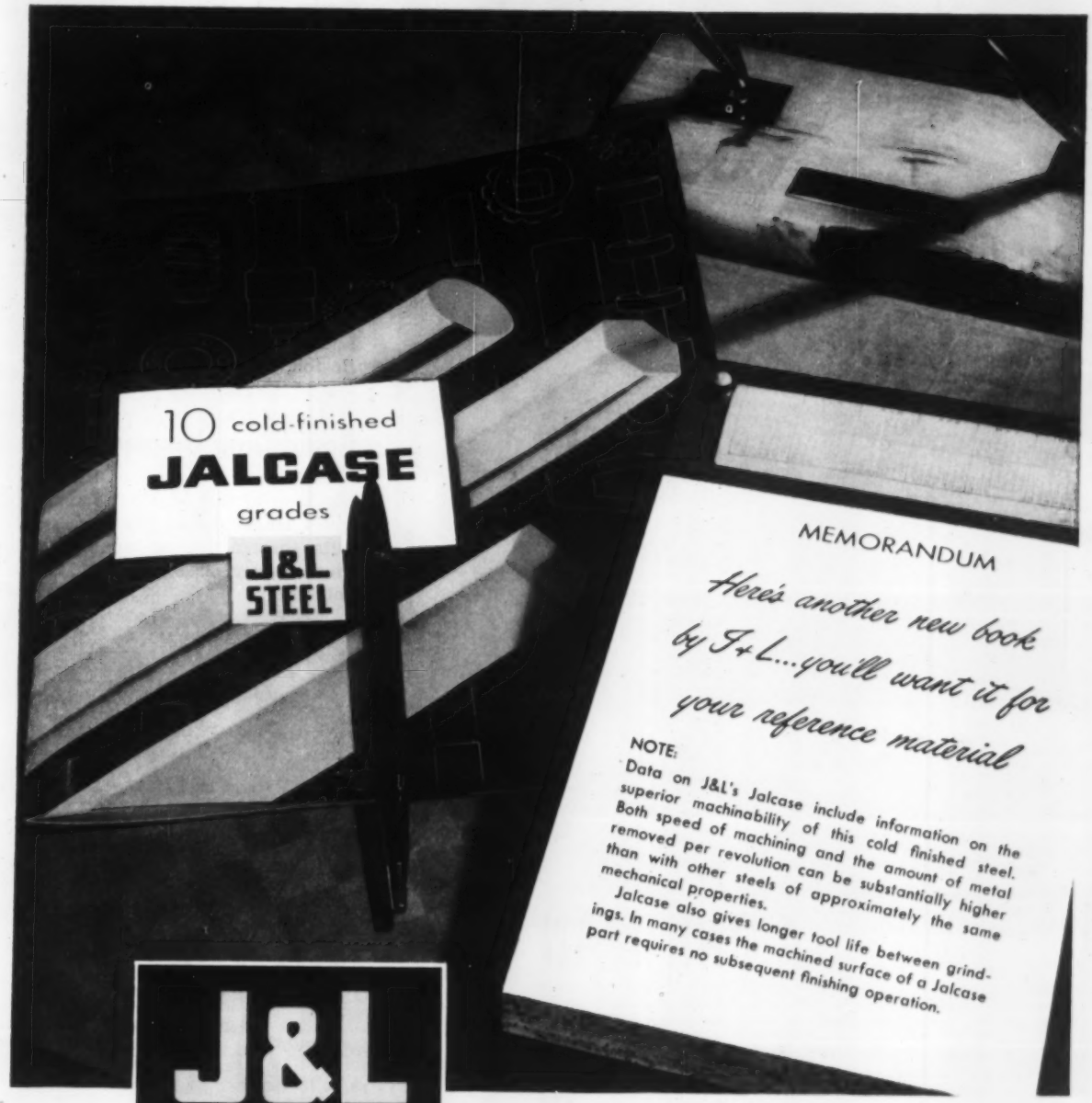
The unit features a pistol-grip

trigger release and a new dust and moistureproof gage that shows the unit's charged pressure. A diffuser horn gives wide discharge pattern coverage. *Write*: Walter Kidde & Co. Inc., Public Relations, 260 Madison Ave., New York 16, N. Y. *Phone*: Murray Hill 3-4900

Armature Turning Lathe

A new principle of armature turning is introduced in the Model 1AL. Designed for fractional horsepower motors, the machine turns




10 cold-finished
JALCASE
grades
J&L
STEEL
MEMORANDUM
Here's another new book
by J+L...you'll want it for
your reference material
NOTE:
Data on J&L's Jalcase include information on the superior machinability of this cold finished steel. Both speed of machining and the amount of metal removed per revolution can be substantially higher than with other steels of approximately the same mechanical properties.
Jalcase also gives longer tool life between grindings. In many cases the machined surface of a Jalcase part requires no subsequent finishing operation.

J&L STEEL

You can help us place a copy of this *new* book in your hands. Please give us your name and address. We'll do the rest. It will be *mailed* without cost to you—no intrusion on your time.

Jones & Laughlin Steel Corp., Dept. 404
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MAKES RE-INSTALLATION A ONE-MAN JOB

All you need is a Leveling BARRYMOUNT® isolator on each machine foot — and in just a few minutes the machine is producing again. This gives you these advantages.

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PLUS { BARRY *machine mounts isolate vibration, so machine accuracy is protected, machine life is prolonged, and maintenance costs are reduced.*

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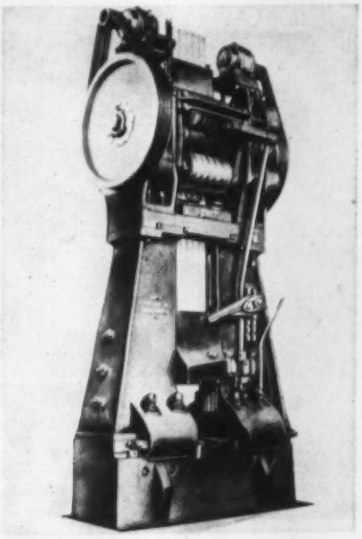
NEW PRODUCTS and equipment

the commutator while the armature revolves on its own axis, assuring accuracy, fine finish and greater production.

A power-driven tool slide makes depth and length of cut automatic. Tolerances are held on duplicate work to 0.0005-in. Established production time for a ⅜-in. length of commutator surface is 11 seconds from tray to tray. *Write*: Rivett Lathe & Grinder Inc., Brighton 35, Boston, Mass. *Phone*: Stadium 2-4530

Board Drop Hammer

The four-roll design of the lifting head of this 10,000-lb hammer gives longer board life and permits construction of hammers in much larger sizes than the two-roll design.



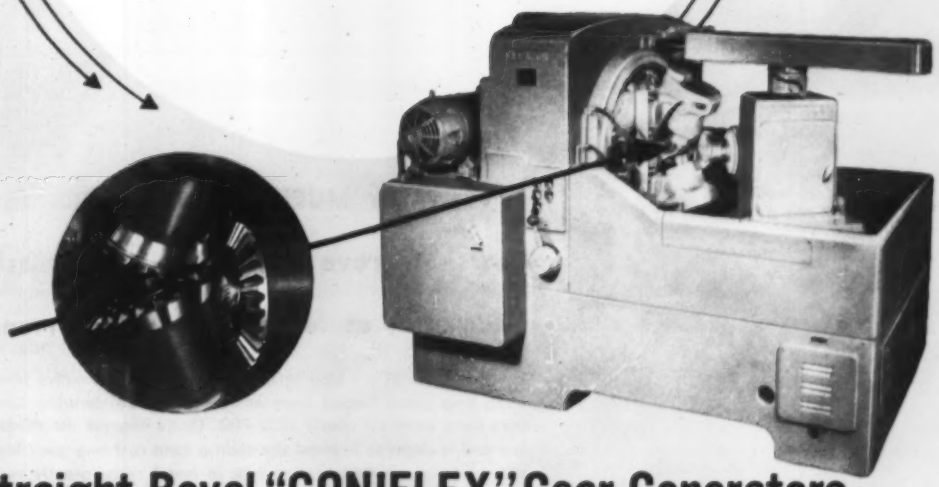
The unit is equipped with air-operated board clamps which are released by air and set by a weight. *Write*: Erie Foundry Co., Erie, Pa. *Phone*: 26754

Descaling Machine

The Model ES-537 will clean both sides of hot rolled sheets, plates or coils simultaneously. Rate: 360 sq ft a side a minute. It is equipped with eight standard Rotoblast wheels which throw 480,000 lb of abrasive an hour.

The unit can be placed convenient to production lines since it

Something New at ILLINOIS GEAR



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It's another step forward at Illinois Gear—more fine, new machine tools added to our ever expanding production facilities to give you faster service and finer quality. Installing the finest in new and improved equipment is a constant activity at Illinois Gear. It is in keeping with our policy of being "first with the finest." Send your next gear order to Illinois Gear—get the utmost in service and quality.

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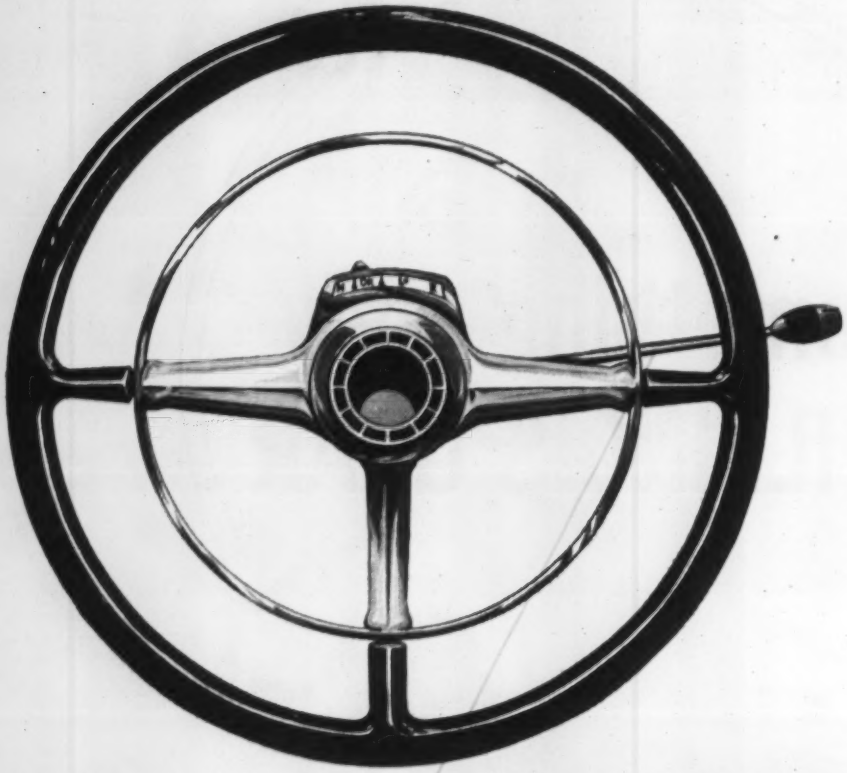


How a shift in gears saved $256,000

Five million MUELLER BRASS CO. forged ring gears improve automatic transmission operation . . . at lower cost to the manufacturer.

Ever since one of the leading manufacturers of automotive transmissions began using ring gears forged from Mueller Brass Co. bearing bronze, production costs have been cut nearly $256,000. That's because the rough forging weighs less and is closer to finished size than a sand cast ring gear formerly used. This shift in gears resulted in a savings in metal costs, greatly reduced machining time and increased tool life. In addition, the use of forged gears has cut scrap loss and eliminated costly inspection rejects.

The performance of these forged ring gears is also far superior to the sand cast gear, which had a tendency to flake away and crack around the teeth, causing failures. More than five million forged ring gears have now been used in these transmissions without a single failure. Being porous, the sand casting was difficult to balance, but the forging has a dense, homogeneous structure that helps keep it in perfect balance.

Strong, long-wearing non-ferrous metal parts, forged to your specifications by Mueller Brass Co., can help reduce your costs and improve the performance of your products just as they have done in this transmission application. For complete information, write us today.

Write today for your complete set of Mueller Brass Co. engineering manuals.

MUELLER BRASS CO. PORT HURON 19, MICHIGAN

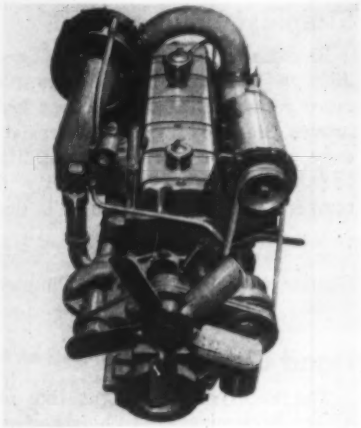
154

NEW PRODUCTS and equipment

takes little floor space. Pushbutton controls make it possible for one man to handle the operation. *Write*: Pangborn Corp., Hagerstown, Md. *Phone*: Mulberry 5-8291

Diesel Engine

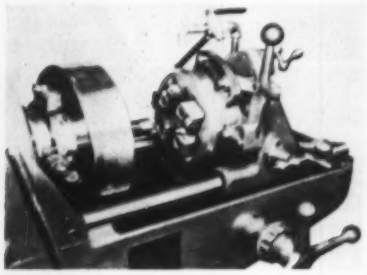
A new lightweight, 175-hp Turbodiesel has been developed for trucks in the 19,500 to 26,000-lb GVW class. Designated the JT-6, it is a six cylinder, inline type which weighs only 9.2 lb per horsepower.



Turbocharging is the key to the high horsepower available from this small engine. *Write*: Cummins Engine Co. Inc., Columbus, Ind. *Phone*: Columbus 4461

Stationary Die Head

Designed for maintenance work, the Little Lansta fits the 2-in. Little Landis pipe threading and cutting machine. Developed primarily to replace the die head previously furnished with this machine, it is of more rigid construction; it incorporates an improved mechanism to assure positive locking and features a one-third



any plant addition in which "Automatic" Sprinklers have not been extended is a weak link in the chain of protection. It's a critical area in which fire may cause considerable property damage and complete disruption of business continuity. Once out of control, fire in an unprotected section might possibly lead to complete destruction of property, even though other building areas are protected.

You can't afford to be half safe. Install

ENGINEERED "Automatic" Sprinkler PROTECTION

throughout all buildings susceptible to fire. Being 100% protected 100% of the time is good business. And — it's well to remember — ***what's worth insuring is worth protecting!***

"Automatic" Sprinkler
CORPORATION OF AMERICA
YOUNGSTOWN, OHIO

Offices in Principal Cities of North and South America

increase in chaser length.

It comes in two sizes, the ¾-in. head, with a ⅛ to ¾-in. pipe range; and the 2-in. head, with a 1 to 2-in. range. *Write*: Landis Machine Co., Waynesboro, Pa. *Phone*: 222

Bucket Elevator

Designed for handling of metal parts weighing up to 1 lb each, the Armorbelt Bucket Elevator feeds to automated production lines and heat treating operations, removes stampings and forgings from presses, elevates parts to an overhead conveyor or bin and unloads filter presses.

Aluminum alloy and stainless steel units are available for handling corrosive chemicals and magnetic materials. *Write*: M-H Standard Co., 515 Communipaw Ave., Jersey City, N. J. *Phone*: Henderson 3-5834

Stainless Wire

Blue Label Stainless, a new type 302, is designed for springs. A more restricted analysis range improves the alloy's corrosion resistance, coiling properties and ability to take sharp bends. Uniformity of temper from coil to coil also is improved. *Write*: Webb Wire Division, Carpenter Steel Co., New Brunswick, N. J. *Phone*: Charter 7-4668

Hand Chain Hoists

The Zephyr lightweight line of all-steel, spur-geared hoists features compact snagproof and weather-tight full enclosures. Low headroom requirement permits their use in tight spots. Their lightness makes them easily portable.

They are available in ½, 1, 1½, 2, 3, 4 and 5-ton capacities. *Write*: Chester Hoist Division, National Screw & Mfg. Co., Lisbon, O. *Phone*: Harrison 4-7248

FOUND HERE WORLD FAMOUS AIRCRAFT ARE "BORN"

GRAND RAPIDS GRINDERS

Grand Rapids No. 55 Hydraulic Feed Surface Grinder
This precision tool room type machine Table speed up to 125 fpm. Working surface of table is 12" x 36". Vertical movement of wheel head 18". Preloaded ball bearing spindle greased for life. Spindle speeds 1925 and 2500 rpm.

Just take a look in their toolrooms! Every one of these famous aircraft manufacturers uses Grand Rapids Grinders . . . engineered and built for unusual long life of precision grinding. Our Model 55 shown here, for instance, features column and base of massive, one-piece casting for vibrationless rigidity and permanent alignment. Both longitudinal table travel and cross feed are hydraulically actuated. Wheel head has powered rapid vertical travel. Table speed is variable up to 125 fpm . . . faster than any other of this type and size.

That's why so many tool room men insist on Grand Rapids Grinders.

Just a note on your letterhead will bring you full details.

GALLMEYER & LIVINGSTON

GALLMEYER & LIVINGSTON COMPANY 407 Straight Ave., S.W., Grand Rapids, Mich.

NEW literature

Gage Blocks

A new catalog contains complete specifications and prices of Ellstrom chromium-plated gage blocks — 8 pages. Ellstrom Standards Division, Dearborn Gage Co., 22038 Beech St., Dearborn, Mich.

Overhead Cranes

A variety of standard and special overhead cranes are described—32 pages. Moffett Engineering Co., 579 Cleveland Ave., Albany, Calif.

Stainless Steel Valves

"Valve Technical Data" covers design, selection, maintenance and repair of stainless valves—12 pages. Public Relations Division, Cooper Alloy Corp., Hillside, N. J.

Switchgear, Compressor

"Allis-Chalmers Low-Voltage Switchgear" — bulletin 18B8283, 4 pages — and "Two-Stage 'Ro-Flo' Compressors"—bulletin 16B8244, 4 pages — are offered. Allis-Chalmers Mfg. Co., 1021 S. 70th St., Milwaukee, Wis.

Transformer Maintenance

"Repainting Transformers in the Field" discusses painting methods, preparation of paint and number of coats required—bulletin GET-677F, 8 pages. General Electric Co., Schenectady 5, N. Y.

Spectrographic Source Unit

Specifications and features of three available circuits are presented—bulletin 35A, 4 pages. Baird Associates Inc., 33 University Rd., Cambridge 38, Mass.

High-Strength Steels

Data are given on Republic "50," "65" and "70" steels—forms ADV-668 and ADV 667, 4 pages each. Advertising Division, Republic Steel Corp., 3100 E. 45th St., Cleveland 27, O.

Conversion Charts

Here is a pocket-size bulletin of charts for wire gage and temperature conversion—bulletin GEZ-1510. Industrial Heating Dept., General Electric Co., Schenectady 5, N. Y.

Blast Cleaning

Information is given on abrasive blast cleaning of electrical parts—bulletin 834. American Wheelabrator & Equipment Corp., 1157 S. Byrkit St., Mishawaka, Ind.

Publication List

More than 100 welding and cutting technical reprints, textbooks, safety booklets, slide films and movies are described—16 pages. Air Reduction Sales Co., division of Air Reduction Co. Inc., 60 E. 42nd St., New York, N. Y.

Electrode Chart

This comparison chart lists classifications and all electrodes made by major manufacturers which fall into each class. McKay Co., 330 McKay Bldg., Pittsburgh 22, Pa.

Batteries

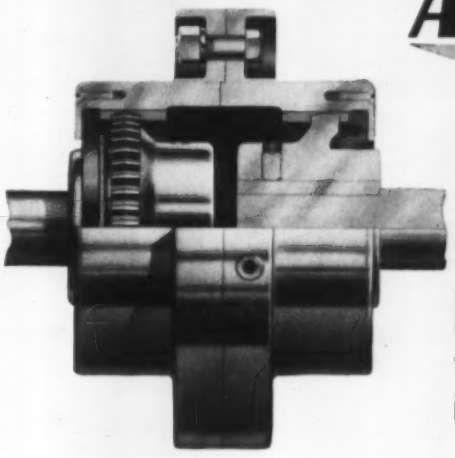
Covered are Hi-Power batteries for use in the control, switchgear, emergency lighting and auxiliary power fields—bulletin CP-538/55, 4 pages. Advertising Dept., C & D Batteries Inc., Washington and Cherry Sts., Conshohocken, Pa.

Stub Tap Standards

Listed are complete stub tap standards of the National Screw Machine Products Association—4 pages. Besly-Welles Corp., 100 Dearborn Ave., Beloit, Wis.

YOU can afford

AJAX



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because the best coupling is the cheapest

Whether your executive position concerns design, manufacturing, selling, maintenance or service, — the performance of your equipment depends on the coupling!

AJAX Dihedral Couplings are radically improved gear-type couplings designed to handle offset, angular and end float shaft misalignment far beyond capacities of conventional flexible couplings.

Simplify your machine design, manufacturing, installation and maintenance. AJAX Dihedral Couplings make it possible to design misalignment into heavy duty equipment as well as out.

Exclusive AJAX Dihedral tooth design* permits holding tooth clearance (backlash) to lubrication film requirements. Load is distributed at center of teeth, the point of greatest strength. All teeth are hardened to combine hard wear surface with tough core. Seals keep lubrication IN.

Phone the AJAX representative or write the factory for case histories, — you will spark-plug some worth-while thinking.

Also manufacturers of a complete line of AJAX Rubber-Bronze Bushed Couplings and Vibrating Conveyors.

Representatives in Principal Cities • Consult your Telephone Directory

AJAX FLEXIBLE COUPLING CO. INC.

*Patents Pending

WESTFIELD, N. Y.

Why STERLINGS are MAN'S BEST Materials-Handling FRIEND!

Ask about liberal dealer sales plan

1. **ALWAYS READY** to use . . . no fuel or other "operating supplies" needed.
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4. **NO MAINTENANCE** Problems . . . nothing to get out of order . . . rugged, long-lasting.
5. **EASIEST WHEELING** . . . with choice of pneumatic, semi-pneumatic or steel-tired wheels (with plain, ball or roller bearings.) These are the easiest rolling wheelbarrows made!
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7. **EASIEST CLEANEST-DUMPING** . . . steel trays engineered to unload completely, with least effort.

Costs Less per Year

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

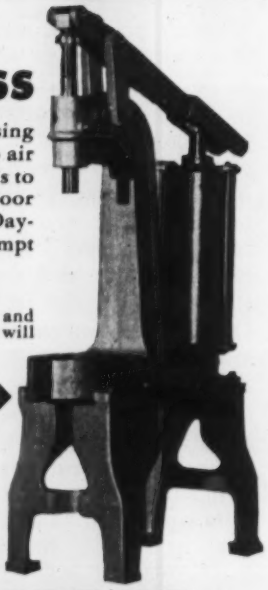
Sterling WHEELBARROWS

A 8245-3/5

SAVE!

WITH A HANNIFIN AIR PRESS

It's the ideal press for that occasional pressing job. These presses operate off ordinary shop air supply. They're fast and safe. Over 30 models to choose from . . . many for either bench or floor mounting. Capacities from ½ to 18 tons. Daylight to 46 inches . . . reach to 12 inches. Prompt delivery.



WRITE. Complete information and prices on Hannifin Air Presses will be sent on request.

6 Tons (Model B-2) One of more than 30 models. Press with base, $554.

1-ton Hand-D-Press. For small parts manufacturers. Press, $232.

Prices F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.

HANNIFIN

HANNIFIN CORPORATION, 523 S. WOLF ROAD, DES PLAINES, ILLINOIS

NEW LITERATURE

Bench Presses

Design and construction features of Series E, single-acting, open-back power units are given—circular 779-M-4, 12 pages. Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

Magnetic, Enameling Iron

Two booklets are offered: "Armco Magnetic Ingot Iron for D-C Applications," 24 pages, and "Armco Enameling Iron," 32 pages. Product Information Service, Armco Steel Corp., Middletown, O.

Overhead Traveling Cranes

Details of construction and operational features are included. Bedford Foundry & Machine Co., Bedford, Ind.

Trimming Equipment

Described is the Brehm method for trimming drawn shells—12 pages. Steel Products Engineering Co., 1205 W. Columbia St., Springfield, O.

Dictionary of Steel Terms

"Simplified Steel Terms and Engineering Data" includes definitions frequently used in the purchase, manufacture, treating, machining and finishing of steel—32 pages. LaSalle Steel Co., Chicago 80, Ill.

Air Compressor

"Air Power Package" describes the 36-cfm, self-contained Spot-Air portable compressor — form 2302, 8 pages. Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Surface Finishes

Described is Profilometer equipment for measuring surface roughness—12 pages. Micrometrical Mfg. Co., 345 S. Main St., Ann Arbor, Mich.

Diatomite Filter Aids

"Get Perfect Water Clarity with Celite Filtration" covers filtration of potable water, process water and plant wastes—12 pages. Johns-Manville, 22 E. 40th St., New York 16, N. Y.

Electrical Control System

A new system which provides a predetermined repeat or nonrepeat cycle on any machine with a mechanical tripping mechanism is described—bulletin 55-1, 4 pages. Dept. 4A, Security Controls Inc., 255 Franklin St., Buffalo 2, N. Y.

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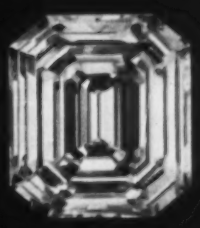
ROEBLING high carbon wire is unsurpassed for industry today. Roebling wire is absolutely true to specifications ...absolutely uniform in gauge and finish. Manufacturers who try Roebling wire once, become Roebling customers from then on.

You *pay* for the best when you buy high carbon wire. Make sure that you *get* it! Always specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.



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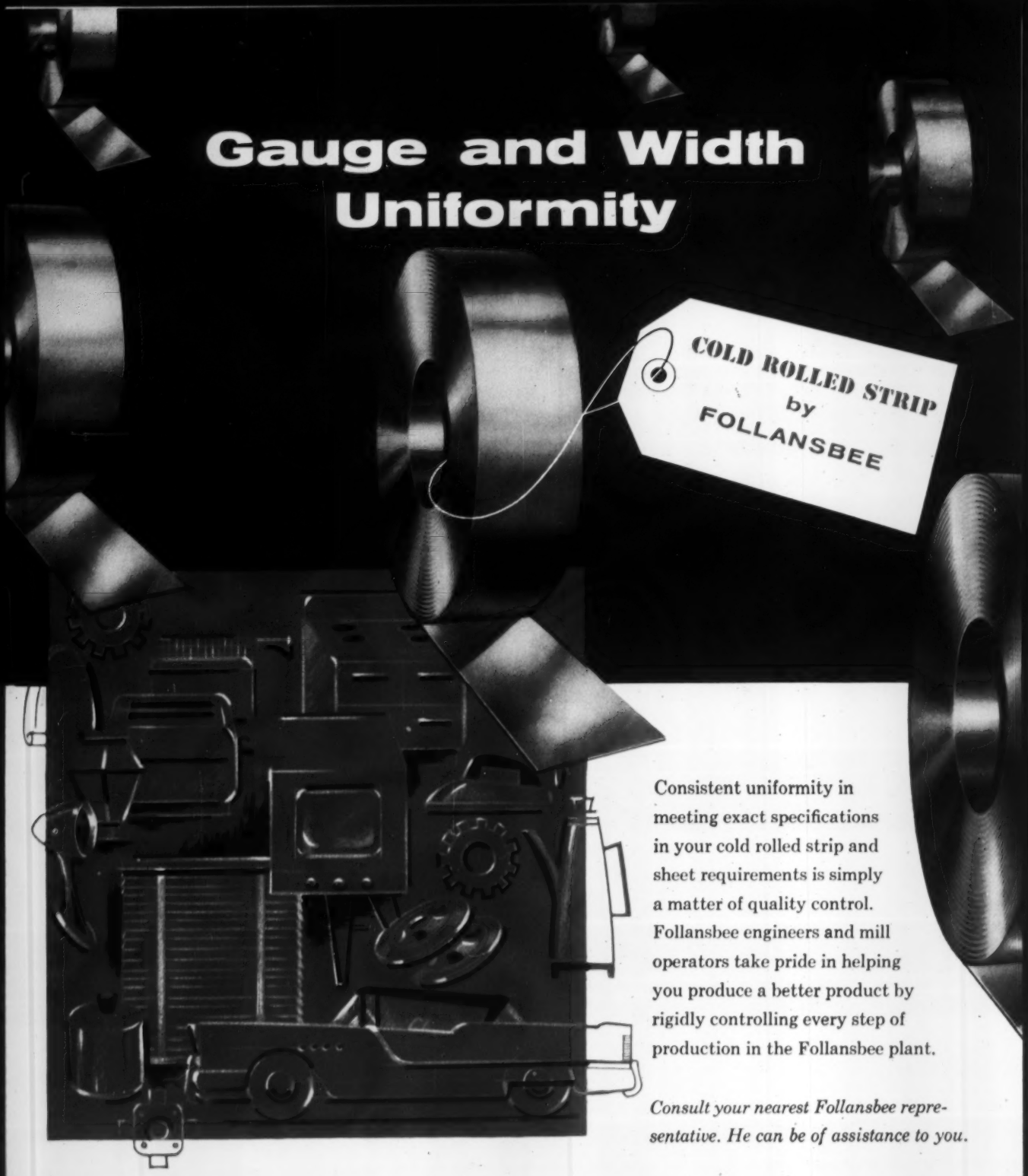
Gauge and Width Uniformity



Consistent uniformity in meeting exact specifications in your cold rolled strip and sheet requirements is simply a matter of quality control. Follansbee engineers and mill operators take pride in helping you produce a better product by rigidly controlling every step of production in the Follansbee plant.

Consult your nearest Follansbee representative. He can be of assistance to you.

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STEEL CORPORATION

FOLLANSBEE, WEST VIRGINIA

Cold Rolled Strip • Seamless Terne Roll Roofing • Polished Blue Sheets and Coils

Sales Offices in Principal Cities

STEEL

June 20, 1955

Market Outlook

BARRING serious labor trouble, demand for steel products promises to hold at a high level through the summer. Some leveling out is anticipated as the vacation season gets into full swing, and some cutbacks in orders on books are expected as auto builders square away for model changes. But the oversold position of the mills is seen offsetting any cancellations and deferments. In fact, such would be welcome as a respite from the mounting demand pressure of recent weeks.

APPRAISAL DELAYED—Full impact of the Ford and General Motors' labor agreements on industry in general will not be known for months. Other unions, notably those in the farm implement and electrical industries, are expected to press demands similar to those accepted by the two big auto builders. But the GAW issue isn't likely to come up in steel until next year at earliest, and this is important since the steel agreement usually sets the pattern for most metalworking.

STEEL DECISION NEAR—Wage negotiations in steel are at the stage where bargaining really gets under way. Steel management is expected to counter the union's proposals this week. Meanwhile, whether the auto agreement will strengthen the steelworkers' hand in pressing for a substantial wage hike is uncertain. Some observers think they do—that the steel union will come out of the present negotiations with a bigger increase than otherwise might have been the case. That, of course, is speculation. In any case, expectations are that the wage issues will be settled without a strike.

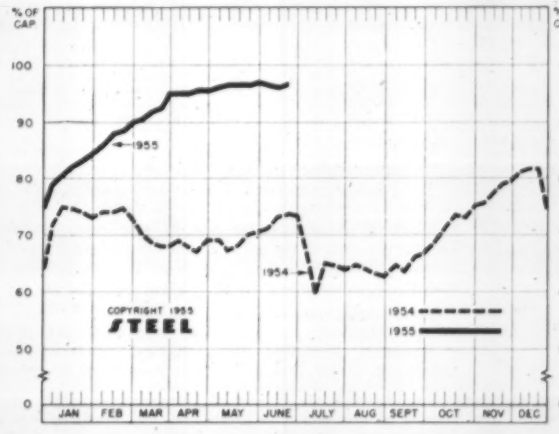
PRESSURE MOUNTS—With the Ford and General Motors' settlements, pressure for sheet steel has increased. Prospects are that cutbacks will be lighter than expected. Some decline in automotive demands is seen, but not the sharp slump that would have accompanied a strike in that industry, especially in cold-rolled sheets. Prospects for continued tight supply and the likelihood that many manufacturers may have to face labor demands similar to those in the auto industry before the year is out, are seen to be sparking hedge buying of steel as manufacturers seek to build up stocks of end-use products.

PROVIDING SUPPORT—Building steel requirements are providing a strong prop to the market. More than 13,000 tons of highway steel came up for bids in the Philadelphia area last week. Another bulge in fabricated structural steel demand looms in New England, with an estimated 175,000 tons seen required for Connecticut highway bridges alone. Other public construction, such as schools, is prominent in the market picture throughout the country.

PRODUCTION—Steel mills operated at 96.5 per cent of capacity last week, equal to production of 2,330,000 tons of ingots and steel for castings. This was a gain of ½-point over the revised rate of 96 per cent for the preceding week.

PRICES HOLDING—Stability is being maintained in the steel market. Indications are no moves will be made, pricewise, pending the determination of steel wages. Last week STEEL's composites held unchanged at $35 for steelmaking scrap, $118.45 for finished steel and $56.54 for No. 2 foundry pig iron.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended June 19	Change	Same Week 1954	Same Week 1953
Pittsburgh	100	+ 2	70	98
Chicago	98	+ 0.5*	83.5	104
Mid-Atlantic	95.5	0	59	98
Youngstown	98	0	72	90
Wheeling	95.5	+ 1	82	99.5
Cleveland	100	— 2.5*	70	99.5
Buffalo	104.5	0	67.5	106.5
Birmingham	93.5	0	78	101
New England	92	+ 2	50	85
Cincinnati	87	— 4	71	95
St. Louis	106	+ 10.5	72.5	99
Detroit	93	0	75	106
Western	108	+ 1	85	108
National Rate	96.5	+ 0.5*	73.5	98

INGOT PRODUCTION‡

	Week Ended June 19	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	145.0†	142.3	145.5	107.4
NET TONS (In thousands)	2,330†	2,286	2,338	1,725

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 53 Technical Outlook—p. 109

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	June 14 1955	June 7 1955	Month Ago	May Average
(1947-1949=100)	144.8	144.8	144.8	144.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended June 14

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.525	Sheets, Electrical	$9.350
Rails, Light, 40 lb	5.917	Strip, C.R., Carbon	7.493
Tie Plates	5.275	Strip, C.R., Stainless, 430 (lb)	0.415
Axles, Railway	7.500	Strip, H.R., Carbon	5.075
Wheels, Freight Car, 33 in. (per wheel)	48.500	Pipe, Black, Buttweld (100 ft)	15.000
Plates, Carbon	4.675	Pipe, Galv., Buttweld (100 ft)	18.606
Structural Shapes	4.517	Pipe, Line (100 ft)	146.804
Bars, Tool Steel, Carbon (lb)	0.430	Casing, Oil Well, Carbon (100 ft)	154.216
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.525	Casing, Oil Well, Alloy (100 ft)	227.878
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115	Tubes, Boiler (100 ft)	‡
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.610	Tubing, Mechanical, Carbon	‡
Bars, H.R., Alloy	8.875	Tubing, Mechanical, Stainless, 304 (100 ft)	167.023
Bars, H.R., Stainless, 303 (lb)	0.423	Tin Plate, Hot-dipped, 1.25 lb	8.533
Bars, H.R., Carbon	5.000	Tin Plate, Electrolytic, 0.25 lb	7.233
Bars, Reinforcing	4.963	Black Plate, Canmaking Quality	6.333
Bars, C.F., Carbon	8.160	Wire, Drawn, Carbon	8.075
Bars, C.F., Alloy	11.375	Wire, Drawn, Stainless, 430 (lb)	0.545
Bars, C.F., Stainless, 302 (lb)	0.438	Bale Ties (bundle)	5.860
Sheets, H.R., Carbon	4.870	Nails, Wire, 8d Common	7.815
Sheets, C.R., Carbon	5.864	Wire, Barbed (80-rod spool)	7.139
Sheets, Galvanized	7.220	Woven Wire Fence (20-rod roll)	16.926
Sheets, C.R., Stainless, 302 (lb)	0.553		

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	June 15 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 avg.=100)	194.53	194.53	194.53	189.75	156.58
Index in cents per lb	5.270	5.270	5.270	5.140	4.242

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$118.45	$118.45	$118.45	$113.20	$94.32
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.47
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	35.00	35.00	34.83	27.83	39.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	June 15 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	4.405	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.40
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.10	3.60
Paltes, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.60
Plates, Claymont, Del.	4.225	4.225	4.225	4.10	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pittsburgh	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.15
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.30
Strip, C.R., Detroit	5.90	5.90	5.90	5.65	4.35-.40
Wire, Basic, Pittsburgh	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50
SEMIFINSHED STEEL					
Billets, Forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$63.00
Wire Rods, $\frac{7}{32}$-$\frac{1}{2}$" Pitts.	4.675	4.675	4.675	4.525	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.13	49.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$34.50	$34.50	$34.50	$29.50	$45.00
No. 1 Heavy Melt, E. Pa.	36.50	36.50	36.00	23.00	35.50
No. 1 Heavy Melt, Chicago	34.00	34.00	34.00	31.00	37.50
No. 1 Heavy Melt, Valley	34.50	34.50	34.50	29.50	43.75
No. 1 Heavy Melt, Cleve.	31.50	31.50	31.50	28.50	41.75
No. 1 Heavy Melt, Buffalo	29.50	29.50	30.50	26.50	39.75
Rails, Rerolling, Chicago	51.50	51.50	51.50	44.50	49.50
No. 1 Cast, Chicago	41.50	41.50	40.50	38.50	47.00
COKE, Net Ton					
Beehive, Furn, Connisvl.	$13.75	$13.75	$13.75	$14.75	$14.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	16.75	16.50
Oven, Fdry, Chicago	24.50	24.50	24.50	24.50	21.00

Daily Nonferrous Price Record

	Price June 15	Last Change	Previous Price	May Avg.	Apr. Avg.	June 1954 Avg.
Copper	36.00	Mar. 29, 1955	33.00	36.000	36.000	30.000
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	13.906
Zinc	12.00	Apr. 6, 1955	11.50	12.000	11.927	10.923
Tin	93.625	June 14, 1955	93.875	91.410	91.458	94.178
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan. 12, 1955	22.20	23.200	23.200	21.500
Magnesium	28.50	Mar. 21, 1955	27.00	28.500	28.500	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99+%, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

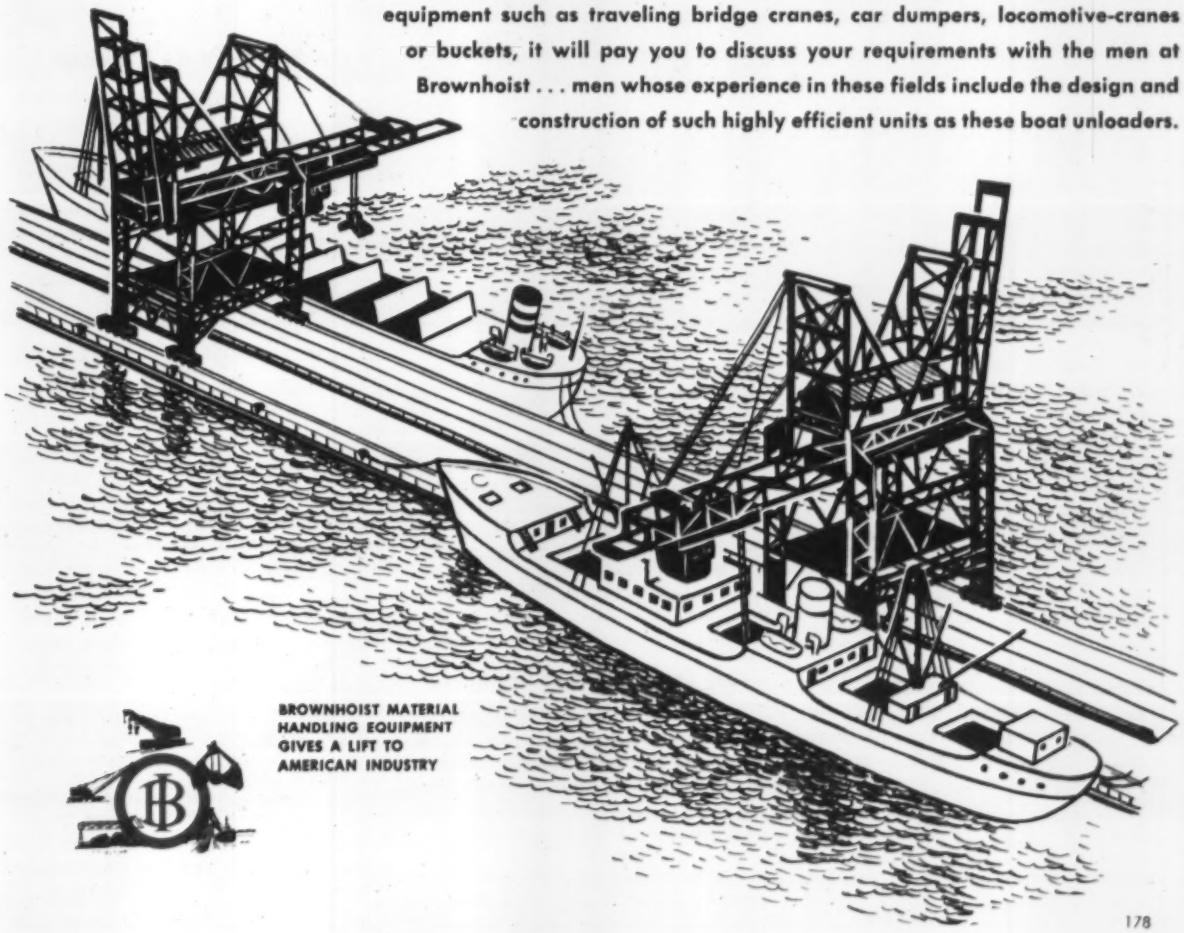
- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

BROWNHOIST

ORE UNLOADERS handle up to 3600 tons per hour at the huge new pier of a large eastern railroad

Two Industrial Brownhoist Ore Unloaders, each with a free-digging capacity of 1800 tons per hour, provide this new pier for ocean-going ore vessels with the most modern and efficient unloading facilities in the United States. Towering over the pier like enormous drawbridges, the Brownhoist machines can travel the full length of the pier and lower apron extensions from either side to provide a reach 72 feet from the dock. Then huge buckets, capable of taking 25 tons of ore in a single bite, roll out on the aprons, return to drop their load into 100-ton receiving hoppers and roll back again for another bite. Elapsed time from bite to bite: just 45 seconds.

Whether your bulk materials handling operations call for ore unloaders or for other equipment such as traveling bridge cranes, car dumpers, locomotive-cranes or buckets, it will pay you to discuss your requirements with the men at Brownhoist . . . men whose experience in these fields include the design and construction of such highly efficient units as these boat unloaders.



BROWNHOIST MATERIAL HANDLING EQUIPMENT GIVES A LIFT TO AMERICAN INDUSTRY

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INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN • DISTRICT OFFICES: New York, Washington, Pittsburgh, Cleveland, Chicago, Denver, San Francisco, Montreal • AGENCIES: Detroit, Birmingham, Houston

Nonferrous Metals

Government's decision to step out of middleman's role in copper causes extra hardship in "hardship" cases. There's 20,000 tons of red metal to be had, but nobody is selling it

Nonferrous Metals Prices, Pages 150 & 151

THE COPPER SITUATION reached the height of frustration last week as nonintegrated mills tried in vain to get a share of the estimated 20,000 tons of the metal made available through stockpile diversion.

Jokingly called "operation snafu" by some government officials, the impasse is the direct result of the government's decision to step out of the copper distribution picture and turn the diverted metal over to producers to dole out on a "fair and equitable" basis.

Surprise!—This decision on May 27 must have caught the producers off guard, because at presstime, none of the metal had made its way into the supply channels. Business & Defense Services officials point out that once it had published Defense Mobilizer Arthur Flemming's letters to Commerce Secretary Sinclair Weeks and General Services Administrator Edmund F. Mansure, BDSA was no longer the middleman. From that point, it was up to the producers to initiate action with GSA to revise their contracts to let them sell the metal directly.

Without that revision, they still would be obligated to ship metal to the government for further disposal. Up to June 15, only one producer—unidentified by Washington sources—had made that move. GSA was considering sending telegrams to the others requesting they come in and talk it over.

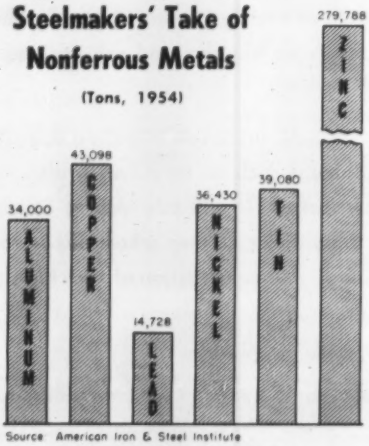
Hard on "Hardships"—When Mr. Flemming made his announcement, there were about 200 "hardship" cases pending at BDSA. Those concerned were notified that they would have to go directly to the producers. At that time, there were about 3000 to 4000 tons of copper still to be distributed from the second-quarter diversion. In the third quarter another 17,000 tons will be available. So there is metal to be had with plenty of takers but no sellers.

Perhaps one explanation of the reluctance of producers to take the necessary initiative is the almost overwhelming number of consumers who are clamoring for copper. Many requests are from small companies producers have not supplied before (nonintegrated firms are trying to get metal wherever they can find somebody to take their orders). Some are from old established customers who are asking for more than they ever have (low inventories are causing them to "beef up" orders). No matter which way they turn, the producers are going to step on toes. Evidently they have decided to be cautious and see what develops.

More Investigation—Meanwhile, consumers who are hurting for metal are writing, wiring or calling congressmen or anybody else in Washington who will listen to them and complaining that they can't get a "fair shake" out of the producers. Undoubtedly the result will be a full-scale investigation by the Yates subcommittee of the House Small Business Committee along the lines of the aluminum investigation. But that doesn't get around the fact that there just isn't enough copper to go around.

Steelmakers' Take of Nonferrous Metals

(Tons, 1954)



Source: American Iron & Steel Institute

Noble Experiment in Aluminum

It looks like the aluminum industry is on the brink of a "noble experiment" to see just what effects the elimination of stockpiling would have on supply and demand. The consequences could be far reaching.

At presstime, it was a good bet that Mr. Flemming would eliminate shipments to the aluminum stockpile for the third quarter. That would free about 200 million lb of the light metal for industry. With that much available, government planners might be able to get an idea of what would happen over the long range if full production were available to the industry. They are looking to the day when there will be no stockpiling. On their impression could hang the decision about a "third round" of expansion.

That round got another boost when the Office of Defense Mobilization granted Olin Mathieson Chemical Corp. a certificate of amortization for a $74-million primary aluminum plant with a capacity of about 60,000 tons a year. There still are some problems to be solved, but the outlook is encouraging. This action follows closely the announcement by St. Joseph Lead Co. and Consolidation Coal Co. of plans to build a 66,000-ton plant. Harvey Aluminum Co., dropped from the government's first third-round plans, is reportedly still interested in building a 54,000-ton plant.

More Nickel To Be Released

Nickel users find little satisfaction from the rumor that the government will release an extra 3 million lb of nickel in July. Most of it will go to defense-rated orders anyway. For July itself, they may make some gain in supply, but the third quarter as a whole probably will be no better, and perhaps even worse, than the second quarter.

Aluminum Production Sets Mark

Primary aluminum production in May set another record for the industry at 262,256,336 lb, about 1.7 million lb better than the previous record set in March. Thus May becomes the third month in 1955 to set a production record. The Aluminum Association reports that shipments of aluminum products for April lagged behind the previous month mainly because of a shorter workmonth. But all classifications except ACSR and bare cable were ahead of April, 1954, shipments.

Market Memos

- Nickel-cadmium batteries which have withstood tests over a temperature range of 135 to −40° F are available for consumer markets. The only significant problem which hasn't been licked is the high initial cost.
- Domestic mine production of both lead and zinc declined in April. Lead was off 2300 tons, zinc 2800 tons.

SLAB ZINC

every grade of ZINC
for urgent military and
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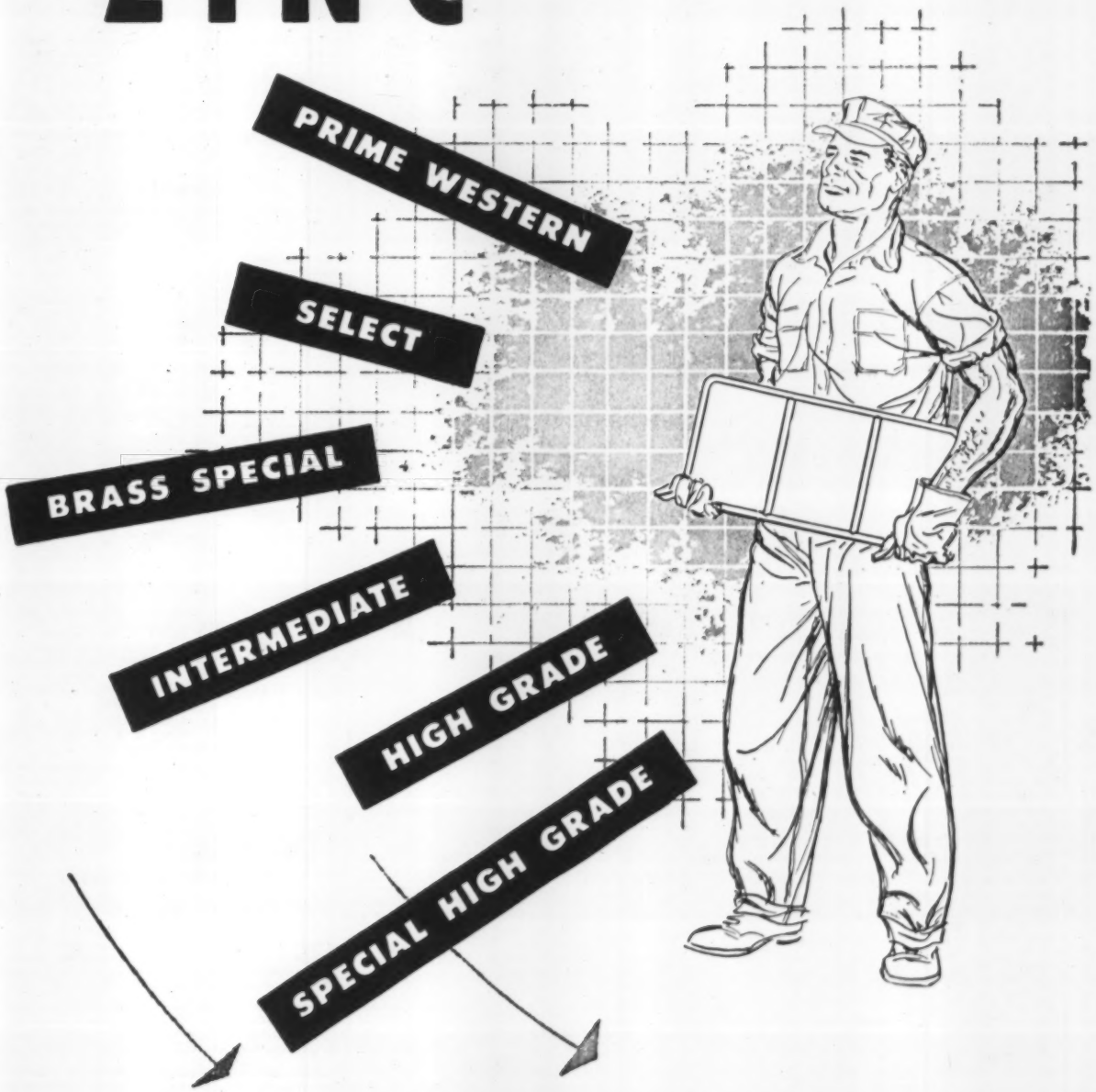


AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 25.00; No. 43, 5% Si, 24.80; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 26.50; No. 195, 4.5% Cu, 0.8% Si, 25.90; No. 214, 3.8% Mg, 26.40; No. 356, 7% Si, 0.3% Mg, 24.90.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb. f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic 36.00 deld. Conn. Valley; 36.00 deld. Midwest; Lake 36.00 deld; Fire refined 35.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$100 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 99%+, cups or ingot, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8%, self-palletizing pig 28.50; notched ingot 29.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.50 for both pig and ingot. Sticks 1.3 in. diameter, 49.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 34.00; alloy M 36.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $288-$290 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3-$3.25 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom., per troy oz.

Palladium: $20-$21 per troy oz.

Platinum: $76-$80 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Silver: Open market, 89.25 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod $68.70 per lb; powder $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 93.625.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max) $3.95, grade A-2 (0.5% Fe max) $3.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots $4.35-$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99+% hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 12.00; brass special, 12.25; intermediate, 12.50, E. St. Louis, freight allowed over 0.50 per pound. High grade, 13.35; special high grade, 13.50. Diecasting alloy ingot No. 3, 16.00; Nos. 2 and 5, 16.50.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, $7.50 per lb. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy, 26.25-27.50; No. 12 foundry alloy (No. 2 grade), 25.50; 5% silicon alloy, 0.60 Cu max, 27.25-28.00; 13 alloy, 0.60 Cu max, 27.25-28.00; 195 alloy, 27.50-28.00; 108 alloy, 26.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 26.50-27.25; grade 2, 25.50-26.25; grade 3, 24.50-25.25; grade 4, 24.00-24.75.

Brass Ingot: Red brass No. 115, 34.50; tin bronze No. 225, 45.00; No. 245, 39.75; high-leaded tin bronze No. 305, 38.00; No. 1 yellow, No. 405, 29.25; manganese bronze No. 421, 31.75.

Magnesium Alloy Ingot: AZ63A, 32.00; AZ91B, 32.00; AZ91C, 32.00; AZ92A, 32.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.74; rod, bar, wire, $1.71.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 41.35; 30,000-lb lots, 41.48; l.c.l., 41.98. Weatherproof, 100,000-lb, 40.78; 30,000 lb, 41.03; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.15; l.c.l., 48.90.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20 per cwt; pipe, full coils $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $14.00-$14.50; sheared mill plate, $11.00; strip, $14.00-$14.50; wire, $10.00-$10.50; forging billets, $8.75; hot-rolled and forged bars, $8.75.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 19.50-20.50; plates, 18.50-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	96
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks		65	

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	63.5	62.0	...	...
0.156-0.172	53.9	52.3	...	...
0.188	53.9	52.3	...	66.8
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	63.7
0.313	51.1	49.5	...	60.8
Cold-finished				
0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.2
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	35.9	40.4	...	...
0.135-0.096	36.4	41.3	...	...
0.095-0.077	37.1	42.3	34.6	39.6
0.076-0.061	37.7	43.2	34.8	39.8
0.060-0.048	38.2	43.6	35.1	40.2
0.047-0.037	38.7	44.5	35.6	40.6
0.037-0.030	39.1	45.0	36.0	41.3
0.029-0.024	39.7	45.5	36.3	41.8
0.023-0.019	40.4	46.9	37.1	42.6
0.018-0.017	41.2	...	37.7	43.5
0.016-0.015	42.1	...	38.5	44.7
0.014	43.1	...	39.5	46.0
0.013-0.012	44.3	...	40.2	47.0
0.011	45.3	...	41.4	48.6
0.010-0.0095	46.5	...	42.5	50.2
0.009-0.0085	47.8	...	44.0	52.3
0.008-0.0075	49.4	...	45.2	54.1
0.007	50.9	...	46.7	56.4
0.006	52.5	...	48.1	61.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72.240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	38.8
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or diam, 72-180 in. lengths

ALUMINUM

Forging Stock: Round, Class 1, 47.80-37.30, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 55.60-41.00 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$16.10	2	$ 49.55
1	25.35	4	136.65
1¼	34.30	6	244.90
1½	41.00	8	368.50

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 97.00, 0.064-in. 76.00, 0.125-in. 61.50, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 59.00, 30,000 lb or more, 0.250 in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 62.00, 30,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in., 72.20; 1 x 4 in., 67.00. Rod, 1 in., 69.00; 2 in., 66.50. Tubing, 1 in. OD x 0.065 in., 90.00. Angles, 1 x 1 x ⅛-in., 75.90; 2 x 2 x ¼-in., 70.00. Channels, 5 in., 70.90. I-beams, 5 in., 70.20.

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 16.00-16.50; old sheets, 13.00-13.50; borings and turnings, 8.00-8.50; crankcases, 13.00-13.50; industrial castings, 13.00-13.50.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.76b	52.36c	....	54.82	32.000	32.000	31.250
Yellow Brass	46.27	46.21d	46.81	49.18	23.875	23.625	22.000
Red Brass, 85%	50.99	50.93	51.53	53.80	28.125	27.875	27.375
Low Brass, 80%	49.75	49.69	50.29	52.56	27.000	26.750	26.750
Naval Brass	49.99	44.30	57.06	53.15	22.125	21.875	21.375
Com. Bronze, 90%	52.78	52.72	53.32	55.34	29.250	29.000	28.500
Nickel Silver, 10%	60.20	62.53g	62.53	....	27.625	27.375	13.813
Phos. Bronze, A, 5%	73.03	73.53	73.53	74.71	32.250	32.000	31.000
Silicon Bronze	58.82	58.01	58.86	60.80e	31.125	30.875	30.125
Manganese Bronze	53.73	47.83	58.24	....	22.125	21.875	21.375
Muntz Metal	48.14	43.95	....	....	22.375	22.125	21.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: No. 1 heavy copper and wire, 32.00-32.50; No. 2 copper, 31.00-31.50; light copper 29.00-29.50; No. 1 composition **red brass, 24.50-25.00; No. 1 composition turnings, 24.00-24.50; yellow brass turnings, 15.00; new brass clippings, 21.50-22.00;** No. 1 brass rod turnings, 19.50-20.00; light brass, 15.50; heavy yellow brass, 17.50-18.00; new brass rod ends, 20.50-21.00; auto radiators, unsweated 18.50-19.00; cocks and faucets, 20.00-20.50; brass pipe, 20.00-20.50.
Lead: Heavy, 11.50-11.75; battery plate, 6.00-6.75; linotype and stereotype, 13.50-14.25; electrotype, 12.00-12.50; mixed babbitt, 12.00-12.50.
Magnesium: Clippings 18.50-19.50; clean castings 18.00-19.00; iron castings, not over 10% removable **Fe, less full deduction for Fe, 16.00-17.00.**
Monel: Clippings, 36.00-37.00; old sheets, 32.00-33.00; turnings, 27.50; rods, 36.00-37.00.
Nickel: Sheets and clips, 75.00-80.00; rolled anodes, 75.00-80.00; turnings, 60.00-65.00; rod ends, 75.00-80.00.
Tin: No. 1 pewter 50.00-59.00; block tin pipe 75.00-77.00; No. 1 babbitt 45.00-48.00.
Zinc: Old zinc 4.50-5.00; new die cast scrap 4.75-5.00; old die cast scrap 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 18.50-19.00; 3003 clippings, 18.00-19.50; 6151 clippings, 18.00-19.00; 5052 clippings, 18.00-19.00; 2014 clippings, 17.50-18.50; 2017 clippings, 17.50-18.50; 2024 clippings, 17.50-18.50; mixed clippings, 17.00-19.00; old sheet, 15.00-16.00; old cast, 15.50-16.00; clean old cable (free of steel), 18.00-19.00; borings and turnings, 16.00-17.50.
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 48.00; light scrap 43.00.
Copper and Brass: No. 1 copper, 35.50; No. 2 copper, 34.00; light copper, 32.25; refinery brass (60% copper) per dry copper content, 30.50-31.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 copper, 35.00; No. 2 copper, 33.00-33.50; light copper, 30.75-31.75; No. 1 composition borings, 27.00-27.50; No. 1 composition solids, 27.50-28.00; heavy yellow brass solids, 19.50-20.50; yellow brass turnings, 18.50-19.50; radiators, 20.50-21.25.

PLATING MATERIAL

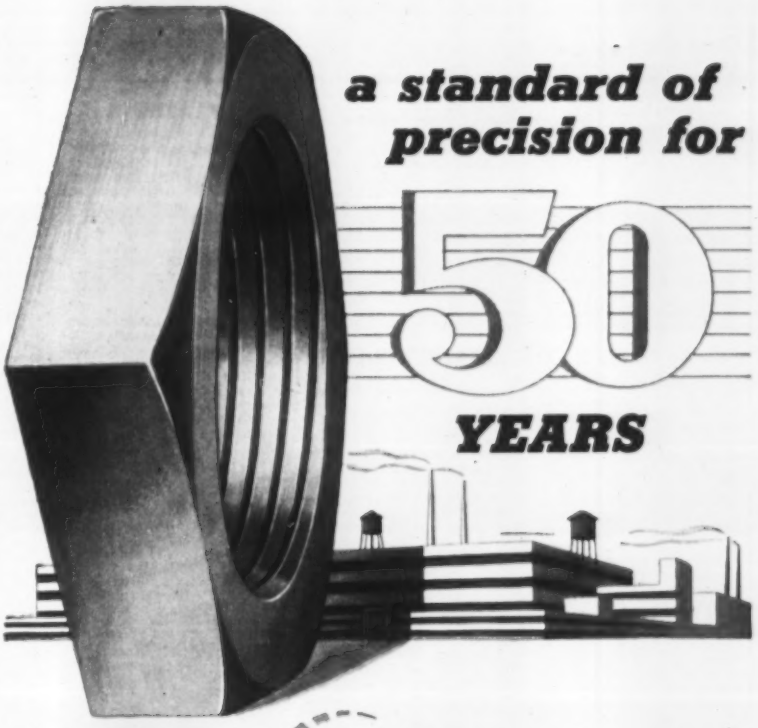
(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.
Copper: Flat-rolled 51.42, oval 50.92, 5000-10,000 lb; electrodeposited 49.40, 2000-5000 lb lots; cast 50.54, 5000-10,000 lb quantities.
Nickel: Depolarized, less than 100 lb $1.015; 100-499 lb 99.50; 500-4999 lb 95.50; 5000-29,999 lb 93.50; 30,000 lb 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.
Tin: Bar or slab, less than 200 lb, $1.125; 200-499 lb, $1.11; 500-999 lb, $1.105; 1000 lb or more, $1.10.
Zinc: Bar 20.00, bar or flat top 19.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.
Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.
Copper Cyanide: 100 lb 76.80; 200 lb 76.05; 300 lb 75.80; 400-900 lb 75.05; 1000 lb and over 73.05; effective Mar. 24, 1955.
Copper Sulphate: Crystal, 100 lb 21.50; 200 lb 18.50; 300 lb 17.50; 400 lb 17.00; 500-1900 lb 15.50; 2000-10,000 lb 15.25; 10,000 lb and up 15.15. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.
Nickel Chloride: 100 lb 46.50; 200 lb 44.50; 300 lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 39.50; 10,000 lb and over 38.50. All prices eastern delivery, effective Jan. 1, 1955.
Nickel Sulphate: 100 lb 38.25; 200 lb 36.25; 300 lb 35.25; 400-4900 lb 33.25; 5000-35,900 lb 31.25; 36,000 lb 30.25. All prices eastern delivery, effective Jan. 1, 1955.
Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.
Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.
Sodium Stannate: Less than 100 lb, 71.50; 100-600 lb, 57.20; 700-1900 lb, 54.70; 2000-9900 lb, 53.00; 10,000 lb or more, 51.90.
Stannous Chloride (Anhydrous): Less than 50 lb, $1.576; 50 lb, $1.236; 100-300 lb, $1.086; 400-900 lb, $1.061; 1000-1900 lb, $1.037; 2000-4900 lb, $1.00; 5000-19,900 lb, 93.90; 20,000 lb or more, 87.80.
Stannous Sulphate: Less than 50 lb, $1.275; 50 lb, 97.50; 100-1900 lb, 95.50; 2000 lb or more, 93.50.
Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.



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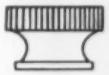
HEXAGON CAP NUTS



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DOUBLE CHAMFERED HEXAGON NUTS

SINGLE CHAMFERED HEXAGON NUTS

Fifty years of manufacturing "know-how" stand behind Fischer brass and aluminum nuts. Combining this experience with special high-speed machinery, Fischer supplies precision *turned* nuts at prices competitive with those produced by other methods . . . cuts normal delivery time to absolute minimum.

New economies in assembly operations are possible with Fischer nuts because each is burrless . . . tapped square with the face . . . cleaned and degreased . . . countersunk on both sides . . . tapped to Class 2 tolerances.

Specify Fischer turned brass and aluminum nuts to fill all of your requirements. An extensive line of standard nuts is offered, and "specials" are produced with speed and economy . . . many types so regularly that they have virtually become "standards" at Fischer.

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C-216-FS

Fischer SPECIAL MFG. CO.

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Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.*
Code numbers following mill points indicate producing company. Key on page 153. Key to footnotes, page 155.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$61.50

INGOTS, Alloy (NT)
Detroit R7 .....$65.00
Houston S5 .....70.00
Midland,Pa. C18 .....65.00
Munhall,Pa. U5 .....65.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Aliquippa,Pa. J5 ....$64.00
Bessemer,Pa. U5 .....64.00
Bridgeport,Conn. N19 ..69.00
Buffalo R2 .....64.00
Clairton,Pa. U5 .....64.00
Ensley,Ala. T2 .....64.00
Fairfield,Ala. T2 .....64.00
Fontana,Calif. K1 .....72.00
Gary,Ind. U5 .....64.00
Johnstown,Pa. B2 .....64.00
Lackawanna,N.Y. B2 ..64.00
LoneStar,Tex. L6 .....70.00
Munhall,Pa. U5 .....64.00
Pittsburgh J5 .....64.00
So.Chicago,Ill. R2, U5..64.00
So.Duquesne,Pa. U5 ...64.00
Youngstown R2 .....64.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 .....$78.00
Bessemer,Pa. U5 .....78.00
Bridgeport,Conn. N19 ..83.00
Buffalo R2 .....78.00
Canton,O. R2 .....80.00
Clairton,Pa. U5 .....78.00
Conshohocken,Pa. A3 ..83.00
Ensley,Ala. T2 .....78.00
Fairfield,Ala. T2 .....78.00
Fontana,Calif. K1 .....86.00
Gary,Ind. U5 .....78.00
Geneva,Utah C11 .....78.00
Houston S5 .....83.00
Johnstown,Pa. B2 .....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 .....87.50
Midland,Pa. C18 .....78.00
Munhall,Pa. U5 .....78.00
Pittsburgh J5 .....78.00
Seattle B3 .....91.50
So.Chicago R2,U5,W14. 78.00
So.Duquesne,Pa. U5 ..78.00
So.SanFranoisco B3 ...87.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$86.00
Buffalo R2 .....86.00
Canton,O. R2, T7 .....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 .....86.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 .....86.00
Houston S5 .....91.00
Ind.Harbor,Ind. Y1 ...86.00
Johnstown,Pa. B2 .....86.00
Lackawanna,N.Y. B2 ..86.00
LosAngeles B3 .....106.00
Massillon,O. R2 .....86.00
Midland,Pa. C18 .....86.00
Munhall,Pa. U5 .....86.00
So.Chicago R2,U5,W14. 86.00
So.Duquesne,Pa. U5 ...86.00
Struthers,O Y1 .....86.00
Warren,O. C17 .....86.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$96.50
Canton,O. R2 .....96.50
Cleveland R2 .....96.50
Gary,Ind. U5 .....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ...96.50

SKELP
Aliquippa,Pa. J5 .....4.00
Fontana,Calif. K1 ....4.775
LoneStar,Tex. L6 .....4.30
Munhall,Pa. U5 .....3.90
SparrowsPoint,Md. B2 ..3.90
Warren,O. R2 .....3.90
Youngstown R2, U5 ....3.90

WIRE RODS
AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 .....4.675
Alton,Ill. L1 .....4.85
Buffalo B11, W12 ....4.675
Cleveland A7 .....4.675
Donora,Pa. A7 .....4.675
Fairfield,Ala. T2 .....4.675
Fontana,Calif. K1 ....5.475
Houston S5 .....4.925
IndianaHarbor,Ind. Y1 .4.675
Johnstown,Pa. B2 .....4.675
Joliet,Ill. A7 .....4.675
KansasCity,Mo. S5 ....4.925
Kokomo,Ind. C16 .....4.775
LosAngeles B3 .....5.475
Minnequa,Colo. C10 ...4.925
Monessen,Pa. P7 .....4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ...5.325
Portsmouth P12 .....4.675
Roebling,N.J. R5 .....4.775
So.Chicago,Ill. R2 .....4.675
SparrowsPoint,Md. B2..4.775
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 .....4.775
Struthers,O. Y1 .....4.675
Torrance,Calif. C11 ...5.475
Worcester,Mass. A7....4.975

STRUCTURALS

Carbon Steel Stand. Shapes
Ala.City,Ala. R2 .....4.25
Aliquippa,Pa. J5 .....4.25
Bessemer,Ala. T2 .....4.25
Bethlehem,Pa. B2 .....4.30
Birmingham C15 .....4.25
Clairton,Pa. U5 .....4.25
Fairfield,Ala. T2 .....4.25
Fontana,Calif. K1 .....4.90
Gary,Ind. U5 .....4.25
Geneva,Utah C11 .....4.25
Houston S5 .....4.30
Ind.Harbor,Ind. I-2 ....4.25
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....4.95
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....4.25
Niles,Calif. P1 .....4.90
Portland,Oreg. O4 .....5.00
Phoenixville,Pa. 4.20
Seattle B3 .....5.00
So.Chicago U5, W14 ....4.25
So.SanFrancisco B3 ....4.90
Torrance,Calif. C11 .....4.95
Weirton,W.Va. W6 ....4.25

Wide Flange
Bethlehem,Pa. B2 .....4.30
Clairton,Pa. U5 .....4.25
Fontana,Calif. K1 .....5.25
Lackawanna,N.Y. B2 ..4.30
Munhall,Pa. U5 .....4.25
Phoenixville,Pa. P4 ....4.30
So.Chicago,Ill. U5 .....4.25

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.20
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.20
Houston S5 .....5.25
Munhall,Pa. U5 .....5.20
So.Chicago,Ill. U5 .....5.20

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.40
Bessemer,Ala. T2 .....6.40
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.40
Fairfield,Ala. T2 .....6.40
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....6.40
Geneva,Utah C11 .....6.40
Houston S5 .....6.45
Ind.Harbor,Ind. I-2, Y1.6.40
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 .....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.10
Munhall,Pa. U5 .....6.40
Seattle B3 .....7.15
So.Chicago,Ill. U5, W14.6.40
So.SanFrancisco B3 ....7.05
Struthers,O. Y1 .....6.40

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ...6.45
Munhall,Pa. U5 .....6.40
So.Chicago,Ill. U5 .....6.40

PILING

BEARING PILES
Munhall,Pa. U5 .....4.25
So.Chicago,Ill. U5 .....4.25

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....5.075
Lackawanna,N.Y. B2 ..5.075
Munhall,Pa. U5 .....5.075
So.Chicago,Ill. U5 .....5.075

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....4.225
Aliquippa,Pa. J5 .....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 .....4.225
Bridgeport,Conn. N19 ..4.475
Buffalo R2 .....4.225
Clairton,Pa. U5 .....4.225
Claymont,Del. C22 .....4.225
Cleveland J5, R2 .....4.225
Coatesville,Pa. L7 .....4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 .....4.325
Fairfield,Ala. T2 .....4.225
Fontana,Calif.(30) K1..4.875
Gary,Ind. U5 .....4.225
Geneva,Utah C11 .....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 .....4.225
Houston S5 .....4.275
Ind.Harbor,Ind. I-2, Y1.4.225
Johnstown,Pa. B2 .....4.225
Lackawanna,N.Y. B2 ..4.225
LoneStar,Tex. L6 .....4.55
Mansfield,O. E6 .....4.225
Minnequa,Colo. C10 ...5.075
Munhall,Pa. U5 .....4.225
Newport,Ky. N9 .....4.225
Pittsburgh J5 .....4.225
Riverdale,Ill. A1 .....4.225
Seattle B3 .....5.125
Sharon,Pa. S3 .....4.225
So.Chicago R2, U5, W14 4.225
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ....4.225
Warren,O. R2 .....4.225
Weirton,W.Va. W6 ....4.225
Youngstown R2,U5,Y1..4.225

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 ....6.025
Geneva,Utah C11 .....5.375

PLATES, Wrought Iron
Economy,Pa. B14 .....9.80

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland J5, R2 .....6.45
Coatesville,Pa. L7 .....6.45
Conshohocken,Pa. A3 ...6.45
Ecorse,Mich. G5 .....6.55
Fairfield,Ala. T2 .....6.45
Fontana,Calif.(30) K1 ..7.15
Gary,Ind. U5 .....6.45
Geneva,Utah C11 .....6.45
Houston S5 .....6.50
Ind.Harbor,Ind. I-2, Y1.6.45
Johnstown,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.35
Munhall,Pa. U5 .....6.45
Pittsburgh J5 .....6.45
Seattle B3 .....7.35
Sharon,Pa. S3 .....6.45
So.Chicago,Ill. U5, W14.6.45
SparrowsPoint,Md. B2 ..6.45
Youngstown U5, Y1 ....6.45

PLATES, Alloy
Claymont,Del. C22 .....5.80
Coatesville,Pa. L7 .....5.80
Fontana,Calif. K1 .....6.45
Gary,Ind. U5 .....5.80
Houston S5 .....5.85
Ind.Harbor,Ind. Y1 ....5.80
Johnstown,Pa. B2 .....5.80
Munhall,Pa. U5 .....5.80
Newport,Ky. N9 .....5.80
Seattle B3 .....6.70
Sharon,Pa. S3 .....5.80
So.Chicago,Ill. U5, W14.5.80
SparrowsPoint,Md. B2 ..5.80
Youngstown Y1 .....5.80

FLOOR PLATES
Cleveland J5 .....5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 .....5.275
Ind.Harbor,Ind. I-2 ....5.275
Munhall,Pa. U5 .....5.275
So.Chicago,Ill. U5 .....5.275

PLATES, Ingot Iron
Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10.4.975
Cleveland c.l. R2 .....4.825
Warren,O. c.l. R2 .....4.825

BARS

BAR, Hot-Rolled Carbon
Ala.City,Ala. R2 .....4.30
Aliquippa,Pa. J5 .....4.30
Alton,Ill. L1 .....4.50
Atlanta A11 .....4.50
Bessemer,Ala. T2 .....4.30
Birmingham C15 .....4.30
Bridgeport,Conn. N19 ..4.55
Buffalo R2 .....4.30
Canton,O. R2 .....4.40
Clairton,Pa. U5 .....4.30
Cleveland R2 .....4.30
Ecorse,Mich. G5 .....4.40
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 .....5.00
Gary,Ind. U5 .....4.30
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
Joliet,Ill. P22 .....4.30
KansasCity,Mo. S5 .....4.55
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.00
Massillon,O. R2 .....4.40
Midland,Pa. C18 .....4.30
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....5.00
N.Tonawanda,N.Y. B11..4.30
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
Seattle B3, N14, P23 ....5.05
So.Chicago R2,U5,W14 ...4.30
So.Duquesne,Pa. U5 .....4.30
So.SanFran.,Calif. B3 ..5.05
Sterling,Ill.(1) N15 .....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 .....5.00
Warren,O. R2 .....4.30
Weirton,W.Va. W6 .....4.30
Youngstown R2, U5 ....4.30

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....5.075
Bridgeport,Conn. N19 ..5.225
Buffalo R2 .....5.075
Canton,O. R2, T7.....5.075
Clairton,Pa. U5 .....5.075
Detroit R7 .....5.075
Ecorse,Mich. G5 .....5.175
Fontana,Calif. K1 .....6.125
FairlessHills,Pa. U5 ...5.225
Gary,Ind. U5 .....5.075
Houston S5 .....5.325
Ind.Harbor,Ind. I-2, Y1.5.075
Johnstown,Pa. B2 .....5.075
KansasCity,Mo. S5 .....5.325
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 .....6.125
Massillon,O. R2 .....5.075
Midland,Pa. C18 .....5.075
So.Chicago R2,U5,W14..5.075
So.Duquesne,Pa. U5 ...5.075
Struthers,O. Y1 .....5.075
Warren,O. C17 .....5.075
Youngstown U5 .....5.075

BARS, H.R. Leaded Alloy
Warren,O. C17 .....5.825

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland R2 .....6.45
Ecorse,Mich. G5 .....6.55
Fairfield,Ala. T2 .....6.45
Fontana,Calif. K1 .....7.70
Gary,Ind. U5 .....6.45
Houston S5 .....6.70
Ind.Harb.,Ind. I-2, Y1 ..6.45
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 .....6.70
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.15
Pittsburgh J5 .....6.45
Seattle B3 .....7.20
So.Chicago W14 .....6.45
So.Duquesne,Pa. U5 ....6.45
So.SanFrancisco B3 ....7.20
Struthers,O. Y1 .....6.45
Warren,O. R2 .....6.45
Youngstown U5 .....6.45

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa. B2 .....4.45

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.30
Atlanta A11 .....4.50
Fontana,Calif. K1 .....5.00
Niles,Calif. P1 .....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SanFrancisco S7 .....4.70

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.20
Gary,Ind. U5 .....5.20
Houston S5 .....5.45
KansasCity,Mo. S5 ....5.45
Youngstown U5 .....5.20

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12,R2.5.40
Buffalo B5 .....5.45
Camden,N.J. P13 .....5.85
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7, C20 .....5.40
Detroit R7 .....5.40
Detroit B5, P17 .....5.60
Donora,Pa. A7 .....5.40
Elyria,O. W8 .....5.40
FranklinPark,Ill. N5 ...5.40
Gary,Ind. R2 .....5.40
GreenBay,Wis. F7 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 .....5.90
Harvey,Ill. B5 .....5.40
LosAngeles R2, S30 ....6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 .....5.40
Plymouth,Mich. P5 .....5.65
Putnam,Conn. W18 .....5.95
Readville,Mass. C14 ....5.95
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 .....5.85
Struthers,O. Y1 .....5.40
Waukegan,Ill. A7 .....5.40
Worcester,Mass. W19 ...5.85
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19.4.65

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 .....6.625
Buffalo B5 .....6.625
Camden,N.J. P13 .....6.80
Canton,O. T7 .....6.625
Carnegie,Pa. C12 .....6.625
Chicago W18 .....6.625
Cleveland A7, C20 .....6.625
Detroit R7 .....6.625
Detroit B5, P17 .....6.825
Donora,Pa. A7 .....6.625
Elyria,O. W8 .....6.625
Gary,Ind. R2 .....6.625
GreenBay,Wis. F7 .....6.625
Hammond,Ind. L2,M13.6.625
Hartford,Conn. R2 ....6.925
Harvey,Ill. B5 .....6.625
Lackawanna,N.Y. B2 ..6.625
LosAngeles S30 .....8.30
Mansfield,Mass. B5 ....6.925
Massillon,O. R2, R8 ....6.625
Midland,Pa. C18 .....6.625
Monaca,Pa. S17 .....6.625
Newark,N.J. W18 .....6.80
Plymouth,Mich. P5 ....6.825
So.Chicago W14 .....6.625
SpringCity,Pa. K3 .....6.80
Struthers,O. Y1 .....6.625
Warren,O. C17 .....6.625
Waukegan,Ill. A7 .....6.625
Worcester,Mass. A7 ...6.925
Youngstown F3, Y1....6.625

BARS, C.F. Leaded Alloy
Ambridge,Pa. W18 ....7.525
Camden,N.J. P13 .....7.70
Carnegie,Pa. C12 .....7.525
Chicago W18 .....7.525
Cleveland C20 .....7.625
Monaca,Pa. S17 .....7.525
Newark,N.J. W18 .....7.70
SpringCity,Pa. K3 .....7.70
Warren,O. C17 .....7.525

BARS, Reinforcing (To Fabricators)
Ala.City,Ala. R2 .....4.30
Atlanta A11 .....4.50
Birmingham C15 .....4.30
Buffalo R2 .....4.30
Cleveland R2 .....4.30
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 .....5.00
Ft.Worth,Tex.(42) T4 ..4.90
Gary,Ind. U5 .....4.30
Houston S5 .....4.55

Ind.Harbor, Ind. 1-2, Y1 4.30
Johnstown,Pa. B2 ..... 4.30
Joliet,Ill. P22 ..... 4.30
KansasCity,Mo. S5 .... 4.55
Lackawanna,N.Y. B2 .... 4.30
LosAngeles B3 ..... 5.00
Milton,Pa. M18 ..... 4.30
Minnequa,Colo. C10 .... 4.75
Niles,Calif. P1 ..... 5.00
Pittsburg,Calif. C11 .... 5.00
Pittsburgh J5 ..... 4.30
Portland,Oreg. O4 ..... 5.05
SandSprings,Okla. S5 .... 4.80
Seattle B3, N14, P23 .... 5.05
So.Chicago R2 ..... 4.30
So.Duquesne,Pa. U5 .... 4.30
So.SanFrancisco B3 .... 5.05
SparrowsPoint,Md. B2 .... 4.30
Sterling,Ill.(1) N15 .... 4.30
Sterling,Ill. N15 ..... 4.40
Struthers,O. Y1 ..... 4.30
Torrance,Calif. C11 .... 5.00
Youngstown R2, U5 .... 4.30

BARS, Reinforcing (Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2 .. 5.70
KansasCity,Kans. S5 .... 6.50
LosAngeles B3 ..... 5.95
Marion,O. P11 ..... 5.55
Pittsburgh J5, U8 ..... 5.72
Seattle B3, N14, P23 .... 6.15
So.SanFrancisco B3 .... 6.00
SparrowsPt. ½-1" B2 .. 5.70
Williamsport,Pa. S19 .. 5.60

RAIL STEEL BARS

Avis,Pa. (3) J8 ..... 4.25
ChicagoHts.(3) C2, I-2.. 4.20
ChicagoHts.(4) C2, I-2.. 4.30
Ft.Worth,Tex.(26) T4 .. 4.75
Franklin,Pa.(3) F5 .... 4.20
Franklin,Pa.(4) F5 .... 4.30
Marion,O.(3) P11 ..... 4.20
Moline,Ill.(3) R2 ..... 4.30
Tonawanda(3) B12 .... 4.15
Tonawanda(4) B12 .... 4.30
Williamsport,Pa.(3) S19.4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks(S.R.) L5 .... 10.85
McK.Rks.(D.R.)L5.... 14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 ..... 4.05
Allenport,Pa. P7 ..... 4.05
Ashland,Ky.(8) A10 .... 4.05
Cleveland J5, R2 ..... 4.05
Conshohocken,Pa. A3 .... 4.10
Detroit(8) M1 ..... 4.15
Dravosburg,Pa. U5 .... 4.05
Ecorse,Mich. G5 ..... 4.15
Fairfield,Ala. T2 ..... 4.05
FairlessHills,Pa. U5 .... 4.10
Fontana,Calif. K1 .... 4.825
Gary,Ind. U5 ..... 4.05
Geneva,Utah C11 ..... 4.15
GraniteCity,Ill. G4 .... 4.25
Ind.Harbor,Ind. I-2, Y1.4.05
Kokomo,Ind.C16 ..... 4.15
Lackawanna,N.Y. B2 .... 4.05
Mansfield,O. E6 (37) 4.05
Mansfield,O. E6 (38) 4.80
Munhall,Pa. U5 ..... 4.05
Newport,Ky N9 ..... 4.05
Niles,O. N12 ..... 4.05
Pittsburg,Calif. C11 .... 4.75
Pittsburgh J5 ..... 4.05
Portsmouth,O. P12 .... 4.05
Riverdale,Ill. A1 ..... 4.05
Sharon,Pa. S3 ..... 4.05
So.Chicago,Ill. W14 .... 4.05
SparrowsPoint,Md. B2 .. 4.05
Steubenville,O. W10 .... 4.05
Warren,O. R2 ..... 4.05
Weirton,W.Va. W6 .... 4.05
Youngstown U5, Y1 .... 4.05

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 ..... 5.35
Kokomo,Ind. C16 ..... 5.20
Niles,O. N12 ..... 4.95

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 .... 6.70
Youngstown Y1 ..... 6.70

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 ..... 6.10
Conshohocken,Pa. A3 .... 6.15
Dravosburg,Pa. U5 .... 6.10
Ecorse,Mich. G5 ..... 6.20
Fairfield,Ala. T2 ..... 6.10
FairlessHills,Pa. U5 .... 6.15
Fontana, Calif. K1 .... 6.875
Gary,Ind. U5 ..... 6.10
Ind.Harbor,Ind. I-2, Y1.6.10
Lackawanna(35) B2 .... 6.10
Munhall,Pa. U5 ..... 6.10
Pittsburgh J5 ..... 6.10
Sharon,Pa. S3 ..... 6.10
So.Chicago,Ill. U5 .... 6.10
SparrowsPoint(36) B2 .. 6.10
Warren,O. R2 ..... 6.10
Weirton, W.Va. W6 .... 6.10
Youngstown U5, Y1 .... 6.10

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 .... 4.30
Cleveland R2 ..... 4.65
Ind.Harbor,Ind. I-2 .... 4.30
Warren,O. R2 ..... 4.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 ..... 4.95
Cleveland J5, R2 ..... 4.95
Conshohocken,Pa. A3 .. 5.00
Dravosburg,Pa. U5 .... 4.95
Ecorse,Mich. G5 ..... 5.05
Fairfield,Ala. T2 ..... 4.95
FairlessHills,Pa. U5 .... 5.00
Follansbee,W.Va. F4 .. 4.95
Fontana,Calif. K1 ..... 6.06
Gary,Ind. U5 ..... 4.95
GraniteCity,Ill. G4 .... 5.15
Ind.Harbor,Ind. I-2, Y1.4.95
Lackawanna,N.Y. B2 .. 4.95
Middletown,O. A10 .... 4.95
Newport,Ky. N9 ..... 4.95
Pittsburg,Calif. C11 .... 5.90
Pittsburgh J5 ..... 4.95
Portsmouth,O. P12 .... 4.95
SparrowsPoint,Md. B2 .. 4.95
Steubenville,O. W10 .... 4.95
Warren,O. R2 ..... 4.95
Weirton,W.Va. W6 .... 4.95
Youngstown Y1 ..... 4.95

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 ..... 7.50
Dravosburg,Pa. U5 .... 7.50
Ecorse,Mich. G5 ..... 7.60
FairlessHills,Pa. U5 .... 7.55
Fontana,Calif. K1 .... 8.55
Gary,Ind. U5 ..... 7.50
IndianaHarbor,Ind. Y1 .. 7.50
Lackawanna(37) B2 .... 7.50
Pittsburgh J5 ..... 7.50
SparrowsPoint(38) B2 .. 7.50
Warren,O. R2 ..... 7.50
Weirton,W.Va. W6 .... 7.50
Youngstown Y1 ..... 7.50

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 .... 5.45

SHEETS, Culvert (16 Gage)

	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.50	7.10
Dravosburg U5	5.70	....
Fairfield T2	5.70	....
Gary,Ind. U5	5.70	5.95
Ind.Harbor I-2	5.70	5.95
Kokomo,Ind. C16	5.80	....
MartinsFry. W10	5.70	....
Newport,Ky. N9	5.70	5.95
Pitts.,Calif. C11	6.45	....
SparrowsPt. B2	5.70	....

SHEETS, Culvert—Pure Iron

Ashland,Ky A10 ..... 6.75
Gary,Ind. U5 ..... 5.95
MartinsFerry,O. W10 ... 5.95

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 ..... 5.45‡
Ashland,Ky. A10 ..... 5.45*
Butler,Pa. A10 ..... 5.45†
Canton,O. R2 ..... 6.45‡
Delphos,O. N16 ..... 6.10‡
Dover,O. R1 ..... 5.45‡
Dravosburg,Pa. U5 ... 5.45†
Fairfield,Ala. T2 ..... 5.45†
Gary,Ind. U5 ..... 5.45*
GraniteCity,Ill. G4 .... 5.65‡
Ind.Harbor,Ind. I-2 ... 5.45†
Kokomo,Ind. C16 ..... 5.55‡
MartinsFerry,O. W10 .. 5.45*
Middletown,O. A10 .... 5.45†
Newport,Ky. N9 ..... 5.45‡
Niles,O. N12 ..... 5.45‡
Pittsburg,Calif. C11 .. 6.20*
SparrowsPt.,Md. B2 ... 5.45‡
Steubenville,O. W10 .... 5.45‡
Warren,O. R2 ..... 5.45†
Weirton,W.Va. W6 .... 5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 .... 6.325

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 .... 8.20
SparrowsPoint(30) B2 .. 8.20

SHEETS, Galvannealed Steel

Canton,O. R2 ..... 5.85
Dravosburg,Pa. U5 .... 5.85
Kokomo,Ind. C16 ..... 6.20
Newport,Ky. N9 ..... 5.85
Niles,O. N12 ..... 5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 .... 5.70

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 ..... 5.70
Butler,Pa. A10 ..... 5.70
Middletown,O. A10 .... 5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 ..... 6.30
Niles,O.(28) R2 ..... 6.30
Weirton,W.Va. W6 .... 6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 ..... 8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 .... 5.375
Cleveland R2 ..... 5.375
Dravosburg,Pa. U5 .... 5.375
Gary,Ind. U5 ..... 5.375
GraniteCity,Ill. G4 .... 5.575
Ind.Harbor,Ind. I-2 .... 5.375
Middletown,O. A10 .... 5.375
Niles,O. N12 ..... 5.375
Youngstown Y1 ..... 5.375

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 .. 7.375
Follansbee(23) F4 ..... 6.60
Yorkville,O. W10 ..... 7.375

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 ..... 5.85
Mansfield,O. E6 ..... 5.85
Middletown,O. A10 .... 5.85
Niles,O. N12 ..... 5.85
Weirton,W.Va. W6 .... 5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .... 6.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod.Steel Strip Corp.
P22 Phoenix Mfg. Co.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellanceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W5 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.05
Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	4.25
Bessemer,Ala. T2	4.05
Birmingham C15	4.05
Bridgeport,Conn. N19	4.35
Buffalo(27) R2	4.05
Conshohocken,Pa. A3	4.10
Detroit M1	4.15
Ecorse,Mich. G5	4.15
Fairfield,Ala. T2	4.05
Fontana,Calif. K1	4.825
Gary,Ind. U5	4.05
Ind.Harbor,Ind. I-2, Y1	4.05
Johnstown,Pa.(25) B2	4.05
Lackaw'na,N.Y.(25) B2	4.05
LosAngeles(25) B3	4.80
Milton,Pa. M18	4.05
Minnequa,Colo. C10	5.15
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	4.80
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
SanFrancisco S7	5.00
Seattle(25) B3, P23	5.05
Seattle N14	5.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
So.SanFrancisco(25) B3	4.80
SparrowsPoint,Md. B2	4.05
Sterling(1) N15	4.05
Sterling,Ill. N15	4.15
Torrance,Calif. C11	4.80
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5	4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.00
Carnegie,Pa. S18	6.70
Fontana,Calif. K1	8.10
Gary,Ind. U5	6.70
Ind.Harbor,Ind. Y1	6.70
LosAngeles B3	7.90
Newport,Ky. N9	6.70
Seattle P23	7.80
Sharon,Pa. S3	6.70
So.Chicago W14	6.70
Youngstown U5, Y1	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.15
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.25
Fairfield,Ala. T2	6.15
Fontana,Calif. K1	7.25
Gary,Ind. U5	6.15
Houston S5	6.40
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lackawanna,N.Y. B2	6.15
LosAngeles(25) B3	6.90
Seattle(25) B3, P23	7.15
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	6.90
SparrowsPoint,Md. B2	6.15
Warren,O. R2	6.15
Weirton,W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R2	4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Boston T6	6.30
Cleveland A7, J5	5.75
Conshohocken,Pa. A3	5.80
Dearborn,Mich. D3	5.85
Detroit D2, M1, P20	5.85
Dover,O. G6	5.75
Ecorse,Mich. G5	5.85
Follansbee,W.Va. F4	5.75
Fontana,Calif. K1	7.50
FranklinPark,Ill. T6	5.85
Ind.Harbor,Ind. I-2	5.85
Ind.Harbor,Ind. Y1	5.75
Indianapolis C8	5.90
LosAngeles C1	7.80
Middletown,O. A10	5.75
NewBedford,Mass. R10	6.20
NewBritain(10) S15	6.75
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	6.50
NewHaven,Conn. D2	6.20
NewKensington,Pa. A6	5.75
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.30
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	5.85
Rome,N.Y.(32) R6	5.75
Sharon,Pa. S3	5.75
SparrowsPt.,Md. B2	5.75
Trenton,N.J.(31) R5	7.30
Wallingford,Conn. W2	6.20
Warren,O. B9, R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75

STRIP, Cold-Rolled Alloy

Boston T6	12.80
Carnegie,Pa. S18	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
Fontana,Calif. K1	14.55
FranklinPark,Ill. T6	12.45
Harrison,N.J. C18	12.45
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	12.75
Youngstown C8	12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	8.60
Dearborn,Mich. D3	8.70
Dover,O. G6	8.60
Ecorse,Mich. G5	8.70
Ind.Harbor,Ind. Y1	8.60

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Boston T6	6.30	8.35	9.30	11.45	14.15
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	....	....
Detroit D2	5.85	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
NewBritain,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewKensington,Pa. A6	5.75	8.05	9.00	11.15	....
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	....	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85

Spring Steel (Tempered)

Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
FranklinPark,Ill. T6	...	...	13.40	16.10	19.50
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

STRIP, Galvanized

Lackawanna,N.Y. B2	8.425
Pittsburgh J5	8.60
Sharon,Pa. S3	8.60
SparrowsPoint,Md. B2	8.425
Warren,O. R2	8.60
Weirton,W.Va. W6	8.60
Youngstown Y1	8.60

STRIP, Electrogalvanized

Cleveland A7	5.75*
Dover,O. G6	5.75*
Riverdale,Ill. A1	5.85*
Youngstown C8	5.75*
Warren,O. B9, T5	5.75*
Weirton,W.Va. W6	5.75*
Worcester,Mass. A7	6.60*

*Plus galvanizing extras.

Strip, Galvanized (Continuous)

Sharon,Pa. S3	6.15
Warren,O. B9	6.15

TIGHT COOPERAGE HOOP

Atlanta A11	4.775
Riverdale,Ill. A1	4.625
Sharon,Pa. S3	4.475
Youngstown U5	4.475

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	9.10	10.00	11.00
Brackenridge,Pa. A4	....	....	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.50*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75*
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

*Semiprocessed, †Fully processed only, ‡Coils annealed, semiprocessed ½c lower. ‡Coils, ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.76	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TINPLATE,American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.Calif. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.60
Dravosburg,Pa. U5	6.60
Fairfield,Ala. T2	6.70
FairlessHills,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.20
Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.20
Yorkville,O. W10	6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$7.85
Gary,Ind. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	6.00
Jacksonville,Fla. M8	6.27
Johnstown,Pa. B2	5.75
Joliet,Ill. A7	5.75
KansasCity,Mo. S5	6.00
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No. Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.20
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
LosAngeles B3	8.15
Milbury,Mass.(12) N6	7.50
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	7.20
So.SanFrancisco C10	8.15
SparrowsPt.,Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7,J4,T6,W12	7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Struthers,O. Y1	6.90
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	11.20
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.55
Waukegan,Ill. A7	11.20
Worcester,Mass. A7, T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. P12	9.90
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE (A)

Alton,Ill. L1	9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester,Mass. T6	9.65
Worcester,Mass. J4	10.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Alton,Ill. L1	13.25
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
FranklinPark,Ill. T6	8.05
Kokomo,Ind. C16	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

NAILS, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	145
Houston,Tex. S5	142
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	142
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	139
Crawfordsville,Ind. M8	139
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	138
Joliet,Ill. A7	138
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
SparrowsPt.,Md. B2	140
Sterling,Ill.(1) N15	138
Worcester,Mass. A7	144

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$8.77
Buffalo W12	8.77
Donora,Pa. A7	8.77
Duluth,Minn. A7	8.77
Joliet,Ill. A7	8.77
Minnequa,Colo. C10	9.02
So.Chicago,Ill. R2	8.77
Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$9.05
Buffalo W12	9.05
Donora,Pa. A7	9.05
Duluth,Minn. A7	9.05
Joliet,Ill. A7	9.05
Minnequa,Colo. C10	9.30
So.Chicago,Ill. R2	9.05
Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$9.10
Buffalo W12	9.10
Donora,Pa. A7	9.10
Duluth,Minn. A7	9.10
Joliet,Ill. A7	9.10
Minnequa,Colo. C10	9.35
So.Chicago,Ill. R2	9.10

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	155
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	155
Duluth,Minn. A7	155
Fairfield,Ala. T2	155
Joliet,Ill. A7	155
Houston S5	160
KansasCity,Mo. S5	160
Kokomo,Ind. C16	157
Minnequa,Colo. C10	160
Pittsburgh,Calif. C11	179
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	159**
Aliquippa J5	156‖
Atlanta A11	164
Bartonville,Ill. K4	165
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	164†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	164†
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	164**
Monessen,Pa. P7	162
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
So.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill.(1) N15	163

WOVEN Fence, 9-15 Ga.

	Col.
Ala.City,Ala. R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149‖
Atlanta A11	151
Bartonville,Ill. K4	152
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	151†
Johnstown,Pa.(43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	151†
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	151**
Monessen,Pa. 9 ga. P17	149
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	150

WIRE (16 Gage)	An'ld Stone	Galv. Stone
Ala.City,R2	13.15	14.70**
Bartonville K4	13.25	15.15
Buffalo W12	13.15	...
Cleveland A7	13.15	...
Crawf'dsville M8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer,Mass.W12	13.15	14.70†
Pitts.,Calif. C11	13.50	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.05
Waukegan A7	13.15	14.70†
Worcester A7	13.45	...

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425‖
Atlanta A11	7.00 7.55
Bartonville(48) K4	7.00 7.575
Buffalo W12	6.90 7.30†
Cleveland A7	6.90 ...
Crawfordsville M8	7.00 7.55
Donora,Pa. A7	6.90 7.30†
Duluth,Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston,Tex. S5	7.15 7.55†
Jacks'ville,Fla. M8	7.425 7.95
Johnstown B2(48)	6.90 7.45*
Joliet,Ill. A7	6.90 7.30†
KansasCity,Mo. S5	7.15 7.55†
Kokomo C16	7.00 7.40†
LosAngeles B3	7.85 ...
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer,Mass. W12	7.20 7.60†
Pitts.,Calif. C11	7.85 8.25†
Portsmouth,O. P12	6.90 ...
Rankin A7	6.90 7.30†
So.Chicago R2	6.90 7.30**
So.S.Fran. C10	7.85 8.25**
Spar'wsPt.B2(48)	7.00 7.55*
Sterling(1)(48)	N15 6.90 7.475
Struthers,O.(48)	Y1 6.90 7.40†
Worcester,Mass.	A7 7.20 ...

*Based on 11c zinc; †5c zinc; ‖10c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants)

4 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅝-in. and ⅝-in.	+4
¾-in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoe	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
¾" and smaller	55
⅞" to 1⅛", inclusive	58
1¼" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
¾" or smaller	38
⅞" to 1½", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	38
⅝-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
⅝-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
7/16-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	...	19.59	19.00
1¼	13	...	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2¼	12	34.63	41.52	33.50
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...(16)	5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.85
Steelton,Pa. B2	4.45	4.35	...	5.35
Williamsport,Pa. S19	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B2	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron: 98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N. Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	21.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frght. allowed	
Cariots	32.20
Ton lots	34.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	33.00-43.00†
Bronze, 5000-lb lots	54.25-57.25†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	94.00
Nickel-Silver, 5000-lb lots	49.75-57.25
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	94.00
Stainless Steel, 316	$1.25
Tin	14.50*
Zinc, 5000-lb lots	17.75-31.50‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh	4.30-4.40
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. ‖70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅜" to 1 7/16"; 1 7/16" to 1 15/16" 4.75c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Deld San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.35c. H.S.-L.A.
(31) Widths over ⅝-in.; 6.40c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	..	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+ 8.5	9.5	+15	....	..	....	...	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless Hills, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+ 8.5	9.5	+15	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1¼		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	...	....	...
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless Hills, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (12.00c; East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25
303	....	25.25	32.75	37.75	....	38.75	40.25	46.00	46.00
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50
304L	....	....	36.75	41.75	40.00	43.00	45.50	49.50	49.50
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50
308	20.75	27.25	36.25	41.75	39.00	43.00	47.00	49.00	49.00
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25
309S	29.75	38.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75
310	35.00	45.25	58.75	68.25	64.75	69.50	71.00	74.25	74.25
314	....	....	....	....	....	....	71.00	....	....
316	29.75	38.00	48.25	56.25	55.00	57.25	60.50	64.50	64.50
316L	....	....	53.25	61.25	60.00	62.25	65.50	69.50	69.50
317	35.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25
330	....	....	61.50	....	....	72.00	73.25	81.25	81.25
18-8CbTa	29.25	38.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50
403	....	....	27.00	30.75	....	32.00	34.25	....	....
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.25	26.25	28.75	30.00	34.25	34.25
414	....	....	....	24.50	....	....	29.25	30.50	35.25	35.25
416	....	....	....	24.50	28.25	....	29.25	....	....	....
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	25.00	28.75	....	29.75	....	....	....
431	15.00	19.25	25.00	28.75	28.00	29.75	31.00	35.75	35.75
446	....	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Uibrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	28.00
304	28.30	33.60	29.75
304-L	30.30	35.50	....
310	41.30	47.00	....
316	33.40	38.80	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	30.00	35.30	34.25
347	32.20	38.60	44.25
405	23.90	31.10	....
410	23.40	30.60	....
430	23.40	30.60	24.25
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold Rolled 10%	Strip, Carbon Base, Cold Rolled Both Sides
Copper*	26.60	33.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include; A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden,Ala. R2	52.38	52.88	....	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo H1, R2	56.00	56.50	57.00	57.50
Tonawanda,N.Y. W12	56.00	56.50	57.00	57.50
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7, R2	56.00	56.50	56.50	57.00
Akron,O., deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Chester,Pa. C31	....	*53.50*	*54.00*	
Philadelphia, deld.		*55.16*	*55.66*	
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos, 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50 Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	85.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate)	$61.00
Lyles,Tenn. T3	70.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Buffalo, 25 cents; Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston, San Francisco and Los Angeles, 10 cents; Atlanta, Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Galv. 10 Ga.†	Stainless Type 302	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	6.79	7.75	8.37	43.43	7.05	...	6.92	8.89	....	7.08	7.09	8.83
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.02§	12.54	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25‡	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.57	45.28§	7.47	...	7.20	8.60	12.60	7.49	7.37	8.59
Buffalo	6.30	7.40	8.84‡	....	6.65	...	6.45	7.40	12.30	6.67	6.60	7.85
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	46.05	6.62	...	6.51	7.25	12.05	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	46.10	6.86	...	6.75	7.55	12.30	6.86	6.81	7.89
Cleveland	6.38	7.38	8.25	46.16	6.72	...	6.57	7.35	12.11	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.54	12.25	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45§	....	6.69	6.52	7.64
Houston	7.35	7.80	9.99	....	7.70	9.30	7.70	9.30	....	7.60	7.35	8.75
Los Angeles	7.50	9.35	9.95	50.75	7.85	11.85	7.45	10.15	13.45	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.44	12.14	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.60	....	7.04	6.87	...
New York	6.97	7.91	8.79	44.95	7.56	...	7.37	8.73§	12.43	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98§	6.96	8.80	6.74	7.86§	12.26	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.35	12.05	6.69	6.52	7.64
Portland, Oreg.	7.00	7.75	9.10	48.50	7.25	...	7.05	10.20	14.00	7.00	6.85	8.75
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.64§	12.34	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.01	....	7.35	7.18	8.30
San Francisco	7.70	9.10	9.60	51.65	7.95	...	7.50	10.20	13.50	7.65	7.55	9.60
Seattle	8.10	9.80	10.15	51.00	8.20	...	7.80	10.95	13.80	7.75	7.80	9.60
Spokane	8.35	9.65‡	10.15	....	7.80	...	7.80	10.85§§	14.55	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11.50-cent zinc except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **¼-in. and heavier; ††as annealed; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 999 lb and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; ‡—500 to 9999 lb; §—4000 lb and over; §—1000 to 1999 lb; §—1000 lb and over; ‡—1500 to 3999 lb; §—2000 to 3999 lb; §—f.o.b. local delivery in lots of 10,000 lb and over.

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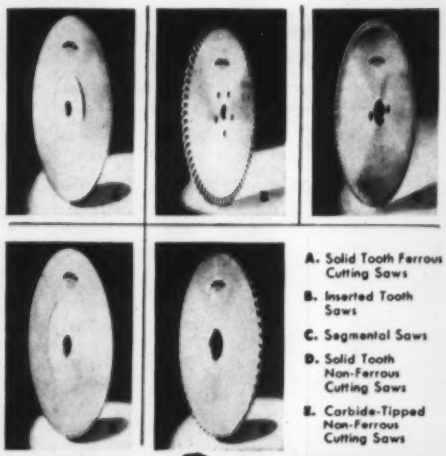

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Circular Metal Cutting Saws

Fasteners Show 16% Sales Gain

Price boost may cause flurry of buying before summer vacations ease demand. Small sizes are tight, large sizes loose. Aluminum makes its bid in the market

SALES of industrial fasteners are running about 16 per cent ahead of the 1954 pace as the second half approaches. With industrial peace, those sales will continue to hold well above year-ago levels.

Based on the 1947-1949 average as 100, the first-quarter sales for the industry reached 149 per cent, compared with 120 in 1954 and 147 in 1953, says Harry O. McCully, vice president in charge of sales, Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y. Latest reports indicate that the second quarter is doing just as well. There may be some slackening during the vacation period, but producers are not worried. They have been dipping into their own inventories for four months and could use the easing to replenish their stocks.

Price Boost—That situation is likely to get worse before it gets better, however. Several manufacturers of fasteners have said they anticipate a price rise because of the expected higher cost of steel later this summer. (About 2.2 per cent of basic steel production goes into fasteners). This probably will bring on a surge of buying, putting a deeper cut in producers' stocks.

Small fasteners are the hardest to get. Some softness is expected when the auto producers make model changes, but another big user, aircraft, will continue to take heavy shipments for months to come.

Demand Gaps—The tightness in supply does not apply to all types and sizes, however. The bigger sizes usually can be had on shorter delivery. Railroad stock and hot-headed bolts are off in demand. High-strength construction bolts are doing well, but not so well as some producers expected. The changing of building codes to allow their use is going slowly, but high-strength bolts offer a big market for the future.

One large type that is doing well is mine roof bolts. The Bureau of Mines says they are being installed in bituminous mines alone at the rate of about 2 million a month, with an additional estimated half million going into noncoal mines. Only 26 per cent of all underground bituminous coal is mined under roofs fastened with these king-sized steel bolts, says the Bureau of Mines, leaving a huge market for development.

Aluminum Makes Bid—The emergence of aluminum as a major metal in this industry is important. Aluminum people are pushing the theme, "Fasten aluminum with aluminum." This eliminates galvanic corrosion resulting from the use of dissimilar metals. As the use of aluminum in construction and component parts grows, so will the use of aluminum fasteners. Other big users: Bus and truck bodies and aircraft. About 450 lb of aluminum rivets fasten the sheets in the Douglas DC-7. Producers also are urging the use of these fasteners with steel, claiming they can be used where a plated bolt is required.

This segment of the industry is attracting not only new companies but also old established firms. Lamson & Sessions Co., Cleveland, one of the largest steel fastener makers, recently brought out a completely new line of light-metal screw products. The company is satisfied that the market is growing and that the current shortage of aluminum will not be a long-range factor. Townsend Co., New Brighton, Pa., another steel fastener producer, is going into aluminum in a big way and has developed several new types of screws in the light metal. The transition from steel to aluminum is not difficult or expensive, because the same basic equipment is used for both.

Nails, Too—Aluminum nails are coming in for a greater share of that market, too. Producers are pushing them not only for installation of aluminum siding and other aluminum parts but also for wood construction where it is desirable to eliminate rust stain inherent with some other nails. Aluminum Co. of America is expanding its fastener plant at Lancaster, Pa., to meet the demand.

There has been a tremendous growth in the number of fastener producers. In 1947 there were 174. Now there are 390. Sales have increased, but not in the same proportion. It doesn't take much overhead to get into the business on a small scale. An official of one large company said: "Many of these are what we call 'alley shops,' and we can't deny they are cutting into our markets." But he summarized the general sentiment of the industry when he said: "We're not crying about business this year."

Aluminum Co. of America

Sheets, Strip . . .

Sheet & Strip Prices, Pages 153 & 154

Pressure for sheets has increased with the peaceful settlement of the Ford and General Motors labor negotiations. Prospects are summer order cutbacks will be lighter than expected, though some decline in automotive requirements is believed likely as summer gets under way. There will be no sharp decline, however, especially in cold-rolled sheets.

Actually, it is not only this consideration of supply but also greater confidence in the business outlook generally for the present at least, that is stimulating demand pressure at the moment. Also, there is another factor—the likelihood that similar labor demands will be made upon manufacturers in general before the year is over.

Many companies, now knowing what lies ahead in this regard, are hard after steel tonnage with which to build up stocks of end-use products as a hedge against possible labor disruptions later in the year. For instance, leading manufacturers of electrical equipment have labor contract negotiations coming up this fall. They may be driving for tonnage for some time, because of this, being more intent than ever on getting in steel.

Little hot and cold-rolled tonnage is available for the third quarter. Cutbacks may be received over coming weeks, but indications are arrearages will be sufficiently substantial to more than offset any cancellations or deferments that come in. Some mills have long since withdrawn from the market for third quarter because of their oversold position.

Wage negotiations in the auto industry scarcely produced a ripple in cold-rolled sheet demand in the Chicago market. Repercussions are not expected now. For the present, car builders are pushing for all the tonnage they specified. Work stoppages at some General Motors plants are preventing intake of steel, however. If these continue, it is likely the mills will be instructed to ship to out-of-plant destinations for storing of steel.

Stainless Steel . . .

Stainless Steel Prices, Page 156

Production continues near capacity, with demand expected to remain strong well into the summer, especially for flat-rolled products. Sales to automakers and aircraft producers are high this month. Labor difficulties aren't expected to have a noticeable effect on demand during the third quarter.

Steel Bars . . .

Bar Prices, Page 152

Hot-rolled carbon bar producers are booked full for the third quarter in most cases. With certain exceptions they are entering tonnage for fourth quarter. Greatest stringency appears to be in 14-inch mill sizes. At the same time, most cold drawers have little cold-drawn carbon bar tonnage to offer before August. Several are understood to be booked up through August on most sizes. Where cold drawers are short of hot stock, October seems to be the best delivery they can offer.

One leading producer of hot-rolled alloy bars is quoting July and August delivery, except on ⅞-inch and smaller sizes. On the latter, the maker is booked up through the third quarter. On cold-drawn alloy bars, this interest is quoting delivery of two months on the larger sizes and 12 to 14 weeks on the smaller.

Barmakers at Pittsburgh don't expect sales to continue at the high June rate through the third quarter, but they will enter the period with large carryover which will support active production well into August. Vacation shutdowns are expected to cut consumer requirements over coming weeks which will tend to slow

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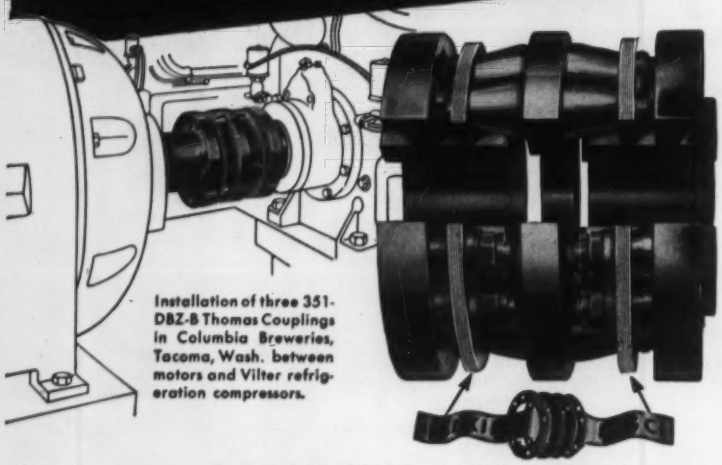

Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

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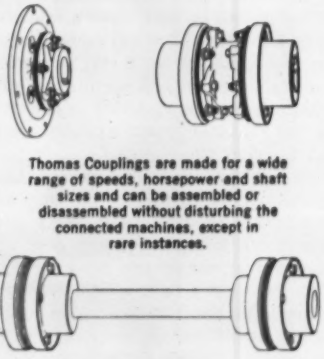

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down demand. A fourth quarter pick-up is confidently expected.

Plates . . .

Plate Prices, Page 152

Some of the plate mills are out of the market for the third quarter, but some have not opened their books for the entire period. Most producers are oversold though their arrearages vary from one to four weeks.

Miscellaneous fabricators' demand is so heavy at Pittsburgh the major producer stopped taking orders for a short period to straighten out its production schedules. Consumers, generally, are having difficulty getting orders on third quarter books, especially for light plates. As a result, demand is spreading from the mill level to the warehouses, which, in turn, are having difficulty maintaining stocks.

While some leveling off in inquiry is noted in the East, demand still is active and diversified. Not only primary sellers but resellers as well are having difficulty meeting current requirements. The carryover tonnage at end of this quarter is expected to be sufficient to keep the mills going at a high rate through most of the summer.

Tin Plate . . .

Tin Plate Prices, Page 154

Shipments of metal cans are running a little ahead of those last year, reports the Census bureau. In the first four months of this year 1,167,627 tons were shipped, against 1,140,381 in the like 1954 period.

April shipments of 321,345 tons were up about 4 per cent from the 307,939 tons moved in March, but were down from the 324,039 tons reported for April last year.

Canmakers are pressing tin plate producers for all the tonnage they can ship to them. Obviously, it is a hedge against a steel strike, and although the odds for such are long, the canmakers will take no chances on supplies during their peak season.

Wire . . .

Wire Prices, Pages 154 & 155

Demand for manufacturers wire is active. Trading is being bolstered by greater confidence in sustained manufacturing activity now that the labor outlook in the automotive industry has taken a more favorable turn. Sellers of merchant wire also report good demand, though volume in some areas has not come up to expectations. Commenting on the over-all market situation, one eastern producer reports that deliveries on annealed steels range six to eight weeks, on tempered, eight to ten weeks.

Demand for merchant wire products in the Chicago area is ahead of that last year, and the outlook for the remainder of the year is reported promising. Sales of fencing and nails are good, with jobbers' inventories normal. Baling wire business is hand-to-mouth, surging up and down with the weather.

Simplex Wire & Cable Co., Cambridge, Mass., is fabricating 1300 miles of submarine telephone cable at its Newington (N. H.) plant. The cable will connect Seattle and Ketchikan, Alaska. The insulated copper core is armored with about 1750 tons of high tensile steel wire.

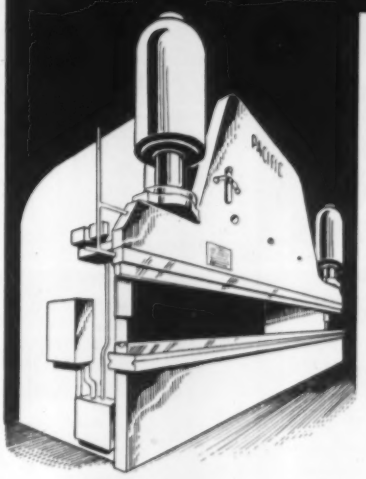
For the transatlantic telephone, Simplex has completed, except for some specialties, submarine cable taking 1725 tons of mild steel for armor, shallow depth, and 375 tons of high tensile steel armor wire for spots 2.5 miles below the surface of the ocean.

Tubular Goods . . .

Tubular Goods Prices, Page 156

The outlook for third quarter business in mechanical, specialty and

Versatility



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BRAKING CORRUGATING
DRAWING BLANKING
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Job can be set up quickly in any position along the bed.
Full tonnage is available at any point in the stroke.
Minimum wastage is obtained through accurate control.
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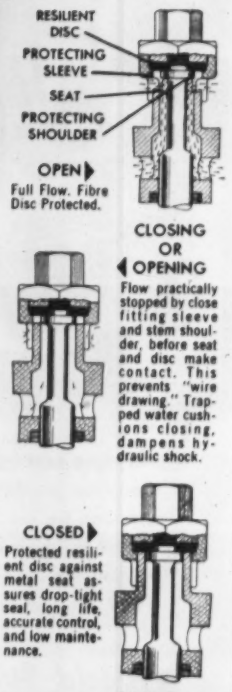
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CLOSED
Protected resilient disc against metal seat assures drop-tight seal, long life, accurate control, and low maintenance.

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It will pay you to get the facts about HOMESTEAD Protected-Seat HYDRAULIC OPERATING VALVES—the valves that give you quick, finger-tip control for moving or positioning any single-acting or double-acting hydraulic piston. The exclusive Homestead Protected-Seat reduces fluid velocity during the closing operation to practically zero. Thus seat erosion and resultant leakage, the most frequent cause of shut-downs and lost production time, is eliminated. Records of 6 to 18 months continuous service without maintenance are common.

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ADDRESS_____
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HOMESTEAD VALVE MANUFACTURING COMPANY
P. O. BOX 22 CORAOPOLIS, PA.

pressure tubing is described as good. Oil country goods makers have backlogs averaging about two months. Indications are there will be substantial carryover tonnage into August, but the trade expects some leveling off in demand after that.

Cast iron pipe demand is seasonally active. New business is developing steadily as municipalities push their improvement and expansion programs.

Bethlehem Steel Co. has ordered a large capacity rotary straightener from Mackintosh-Hemphill Division, E. W. Bliss Co., for early 1956 installation at its new electric weld pipe mill at Sparrows Point, Md. The machine will handle steel pipe in diameters up to 16 in.

Rails, Cars . . .

Track Material Prices, Page 155

A shortage of freight cars has grown more acute in Oregon. Available cars are about 50 per cent of needs, and an emergency order has been issued covering their distribution.

Reasons for the shortage: The truck strike in the West has caused many firms to divert shipments to the railroads; the heavy demand for grain shipments; the limited national supply of rail cars.

Warehouse . . .

Warehouse Prices, Page 157

Some distributors look for June business to equal, if not surpass, that of May, the highest in several years.

Leading distributors say their line of carbon steel products "is being shot full of holes," due primarily to slower mill deliveries. Plate, sheet and structural shapes are particularly tight.

The large volume of current business is due mainly to an increase in orders, although average tonnage per order is somewhat heavier. Practically all specify some processing, such as shearing, cutting to size, slitting or flame cutting.

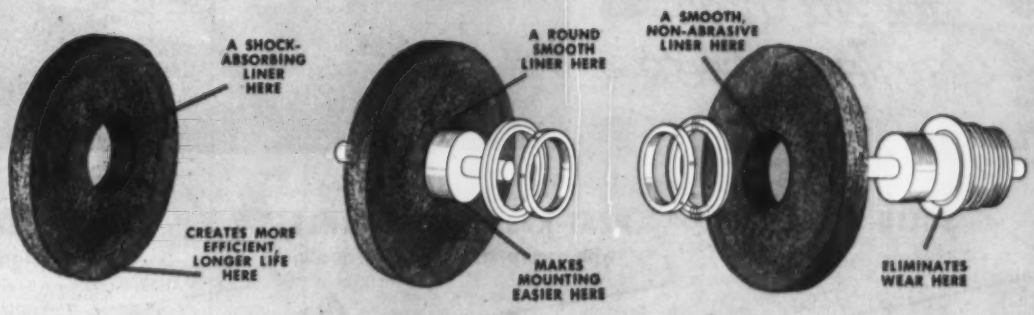
July sales are expected to be larger than last year's, but less than this month's. Much depends on a favorable labor settlement. If mills raise steel prices, warehouses will have to follow.

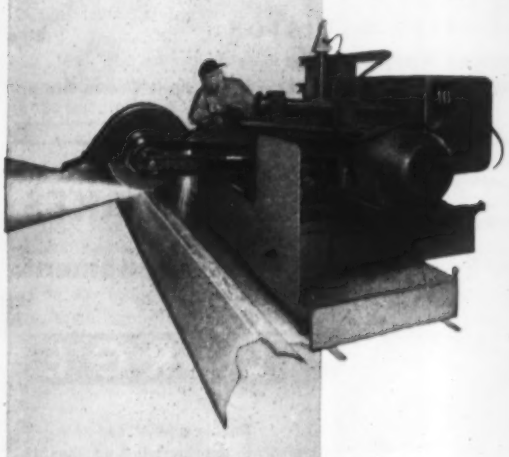
The usual summer letdown among small fabricators has not begun. However, a survey taken by the Tri-state Industrial Association Inc., Pittsburgh, shows that just as many plants will close for vacations as in 1954.

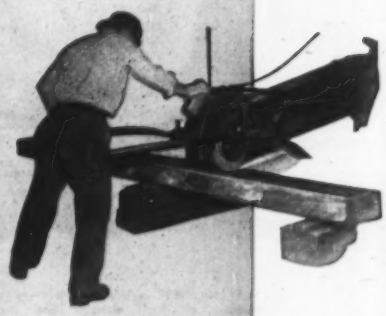
On the West Coast, distributors say the second quarter will be 5 to 10 per cent better than the like

For rugged conditioning jobs you can't beat...

MID-WEST FIBER-CUSHIONED SNAGGING WHEELS


A SHOCK-ABSORBING LINER HERE
CREATES MORE EFFICIENT, LONGER LIFE HERE
A ROUND SMOOTH LINER HERE
MAKES MOUNTING EASIER HERE
A SMOOTH, NON-ABRASIVE LINER HERE
ELIMINATES WEAR HERE





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- **And they're easier on your operator!**

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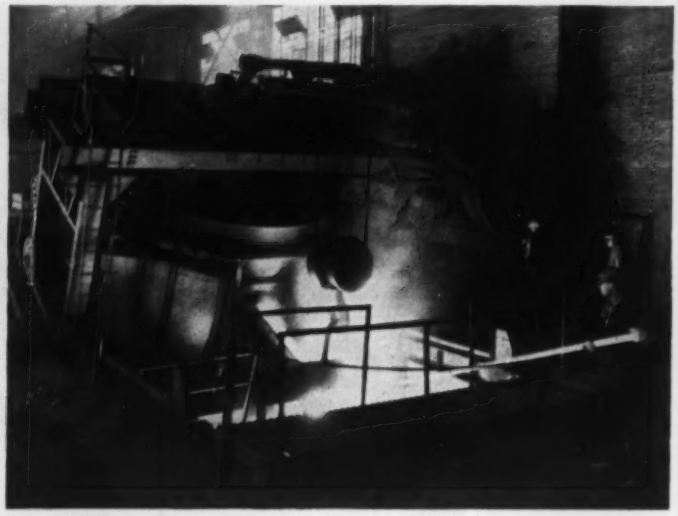

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1954 period and on a par with the good first quarter of this year.

Iron Ore . . .

Iron Ore Prices, Page 165

The Great Lakes fleet transported 2,852,048 gross tons of iron ore in the week ended June 13, reports the Lake Superior Iron Ore Association. This was slightly under the movement of the preceding week, but was substantially above the 2,614,275 tons moved in the like week of the 1954 shipping season. Cumulative shipments to June 13 were reported at 20,394,018 tons, compared with 15,923,542 moved up to June 13 last year.

Record Steel Output in May

The greatest monthly production on record was chalked up by the steel industry in May. Output of ingots and steel for castings was 10,331,000 net tons—163,000 tons more than the 10,168,000 produced in March, 1953, the previous record month.

May production brought the total for the first five months to 47,462,519 net tons, sharply up from the 36,767,998 tons produced in the corresponding period of 1954.

In May the index of steel production (1947-49 equals 100) was 145.2 compared with a revised figure of 142.6 in April when 9,815,095 tons were poured by the furnaces, and 105.0 in May a year ago when output was 7,482,738 tons. The index for the first five months was 137.0.

Ingot operations averaged 96.6 per cent of capacity (rated at 125,828,310 annually) in May. In May a year ago, when capacity was 124.3 million tons, the ingot rate was 70.7 per cent. Operations averaged 91.1 per cent in the first five months of this year.

Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic; 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$25.00-$26.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 85c-87c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$52.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

Rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.00

Antimony Ore

Per unit of 8lb content, c.i.f. seaboard

56-60%	$3.25-$3.80
65%	4.15-4.25

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Puebio, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa. $130; Philadelphia, $116; Woodbridge, N. J., $114.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.50
Camden, N. J., ovens	24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, Ind., ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	24.00
Swedeland, Pa., ovens	24.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	24.25
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Period	Net tons	Per cent of capacity	‡Index	Net tons	Per cent of capacity	‡Index	Net tons	Per cent of capacity	‡Index	Net tons	Per cent of capacity	‡Index	weekly production (Net tons)	Number of weeks in month
1955														
January	8,054,345	86.0	125.7	199,229	49.0	56.7	584,162	63.6	163.6	8,837,736	82.7	124.2	1,994,974	4.43
February	7,734,884	91.5	133.7	197,091	53.7	62.1	564,959	68.1	175.1	8,496,934	88.0	132.2	2,124,233	4.00
March	9,060,026	96.7	141.4	255,493	62.8	72.7	666,235	72.6	186.5	9,981,754	93.4	140.3	2,253,281	4.43
1st Quarter	24,849,255	91.4	133.6	651,813	55.2	63.9	1,815,356	68.1	175.1	27,316,424	88.0	132.3	2,124,139	12.86
*April	8,858,549	97.7	142.9	275,069	69.8	80.9	681,477	76.6	197.2	9,815,095	94.8	142.6	2,287,901	4.29
†May	9,312,000	99.4	145.4	305,000	75.0	86.8	714,000	77.8	199.9	10,331,000	96.6	145.2	2,332,000	4.43
1954														
January	7,256,526	78.3	113.3	260,453	64.0	74.1	434,507	48.9	121.7	7,951,486	75.3	111.8	1,794,918	4.43
February	6,523,213	77.9	112.8	174,253	47.4	54.9	385,771	48.1	119.6	7,083,237	74.3	110.2	1,770,809	4.00
March	6,649,667	71.7	103.8	207,726	51.1	59.1	432,207	48.7	121.0	7,289,600	69.0	102.5	1,645,508	4.43
1st Quarter	20,429,406	75.9	109.9	642,432	54.4	63.0	1,252,485	48.6	120.8	22,324,323	72.8	108.1	1,735,950	12.86
April	6,365,326	70.9	102.7	162,657	41.3	47.8	442,954	51.5	128.2	6,970,937	68.1	101.3	1,624,927	4.29
May	6,817,951	73.6	106.4	198,063	48.7	56.4	456,724	51.4	127.9	7,472,738	70.7	105.0	1,686,848	4.43
June	6,702,006	74.7	108.1	207,666	52.7	61.1	453,962	52.8	131.3	7,363,634	72.0	107.0	1,716,465	4.29
2nd Quarter	19,885,283	73.1	105.8	568,386	47.6	55.1	1,353,640	51.9	129.1	21,807,309	70.3	104.4	1,676,196	13.01
1st Half	40,314,689	74.5	107.8	1,210,818	51.0	59.0	2,606,125	50.3	125.0	44,131,632	71.5	106.2	1,705,900	25.87
July	6,040,120	65.3	94.3	205,313	50.6	58.4	382,164	43.1	107.0	6,627,597	62.9	93.2	1,499,456	4.42
August	6,021,496	65.0	94.0	217,837	53.6	62.0	427,574	48.2	119.7	6,666,907	63.1	93.7	1,504,945	4.43
September	6,140,266	68.6	99.1	214,065	54.5	63.0	453,152	52.8	131.1	6,807,483	66.7	98.9	1,590,533	4.28
3rd Quarter	18,201,882	66.3	95.8	637,215	52.9	61.1	1,262,890	48.0	119.1	20,101,987	64.2	95.2	1,530,997	13.13
9 Months	58,516,571	71.7	103.7	1,848,033	51.6	59.7	3,869,015	49.5	123.0	64,233,619	69.1	102.5	1,647,016	39.00
October	6,973,568	75.2	108.9	237,754	58.5	67.7	490,211	55.2	137.3	7,701,533	72.9	108.3	1,738,495	4.43
November	7,307,151	81.4	117.9	231,191	58.7	68.0	551,085	64.1	159.4	8,089,427	79.1	117.5	1,885,647	4.29
December	7,530,204	81.4	117.6	231,126	57.0	65.8	525,743	59.4	147.2	8,287,073	78.6	116.5	1,874,903	4.42
4th Quarter	21,810,923	79.3	114.7	700,071	58.0	67.1	1,567,039	59.5	147.8	24,078,033	76.8	114.0	1,832,423	13.14
2nd Half	40,012,805	72.8	105.2	1,337,286	55.4	64.1	2,829,929	53.8	133.5	44,180,020	70.5	104.6	1,681,767	26.27
Total	80,327,494	73.6	106.5	2,548,104	53.2	61.6	5,436,054	52.0	129.3	88,311,652	71.0	105.4	1,693,741	52.14

Note—The percentages of capacity operated are calculated on weekly capacities in 1955 of 2,114,196 net tons hearth, 91,810 net tons bessemer and 207,272 net tons electric ingots and steel for castings, total 2,413,278 net tons; based on annual capacities as of Jan. 1, 1955, as follows: Open hearth 110,234,160 net tons, bessemer 4,787,000 net tons, electric 10,807,150 net tons, total 125,828,310 net tons.

Note—The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 91,810 net tons bessemer and 200,397 net tons electric ingots and steel for castings, total 2,384,549 net tons; based on annual capacities as of Jan. 1, 1954, as follows: Open hearth 109,004,730 net tons, bessemer 4,787,000 net tons, electric 10,448,680 net tons, total 124,330,410 net tons.

*Revised. †Preliminary figures, subject to revision. ‡Index of production based on average weekly production of the three years 1947-1948-1949.

LOW COST COLD POINTING MACHINE has STATIONARY DIES!

Designed for cold pointing of tubes and bars of steel and non-ferrous metals, the Stationary Die Swager is built in four sizes for tubes up to 6 inches in diameter. Rate of production is high . . . for example, a 2" diameter mild steel tube by 6 SWG (or .192) can be swaged down to 1 3/16" diameter in this machine at floor to floor production times 10 to 20 seconds each, (i.e. a production rate of 180 to 120 points per hour). This operation can be handled by one man. Write today regarding your specific job problems.

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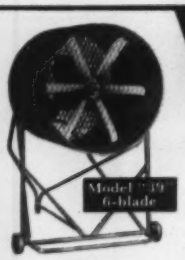

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for spot cooling of men and machines
drying • exhausting • general ventilating

Beat heat and production lags this summer with Aerovent Portable Mancoolers. Pedestal, cradle and wheeled models — all adjustable for 180° directional air discharge. Heavy-duty welded construction. Sizes 24" to 48" for capacities to 40,000 C. F. M.

other models for every air-moving requirement

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Cleveland Steel Tool Co.

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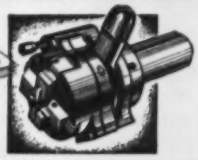

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Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 29.25c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P. 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, C 0.025% max. (Simplex 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy, ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 50-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.5c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer. (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 26.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighting approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.05c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb on Mn). Contract, carload, bulk 11.85c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.45c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.55c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.
(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $12 per lb of contained Cb, less ton $12.06. Delivered. Spot, add 10c.

Ferrotitanium—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $6.25 per lb of contained Cb plus Ta, deld.; less ton lots $6.30.

Silicax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 46c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5.7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ¼" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-S Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.5c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.ob. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Sigio, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity, $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa., $1.24.

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Scrap . . .

Scrap Prices, Page 170

Philadelphia — Scrap prices are slightly stronger, although sentiment is mixed as to prospects over the next several weeks. There has been little new buying of open-hearth steel recently, but consumption continues heavy and yardmen claim that incoming shipments are lagging. One leading district producer of manufacturers scrap, because of cutbacks from the auto trade, will have substantially less material to offer in July and may have even less to offer this month.

The export situation does not appear quite so strong, although prices have continued fairly steady. There is a little less pressure from continental European consumers, with indications that some at least have overbought.

No. 2 bundles for domestic account are slightly higher at $27-$28, delivered. Also, heavy turnings are quoted at $33.50-$34, delivered. Electric furnace bundles are a shade easier at $38.50, delivered; couplers, springs and wheels are quoted at $40.50.

In the cast iron grades, heavy breakable is a bit higher at a flat $41, delivered; drop broken machinery is quoted at a spread of $44-$45. The strike at the Florence, N. J., pipe shop is a factor in the cast market.

Pittsburgh—Settlement of two major auto labor contracts brought a wave of optimism among scrap brokers here. It's predicted the price of No. 1 heavy melting will rise soon, to a possible top of $40 in September. This estimate is based on the assumption mill purchasing agents have delayed placing orders until labor contracts were signed and will need large tonnage of scrap in early third quarter. Brokers are quoting up to $36 for No. 1 heavy melting, but there are no sales at that figure to mills. Railroad scrap strengthened on the basis of the last sales, with prices about $1 a ton above previous quotations.

Boston—Steel scrap prices are leveling off at the recently attained lows. New buying is light, both domestic and export. Worcester is paying $32 for 3-ft structurals and $28 for choice No. 1 heavy melting. Both are in limited supply within the $5 freight area. The eastern Pennsylvania market is nominally $26 to $27 for No. 1 heavy melting, shipping point. Export is down to $30, dock.

New York—The trend is mixed in the cast scrap market, with brokers offering less for unstripped motor blocks at $21-$22, and more for heavy breakable at $32-$34. Steel grades are unchanged.

Buffalo—Mixed tendencies prevail in the scrap market. Heavy receipts are anticipated by water. Also, large reserve stocks are held by the mills. As a result, the high level of steel operations as a factor for strength in scrap is offset. Prices, however, are unchanged.

Chicago—The scrap market here remains unchanged in the absence of either heavy demand or unsettling influences. The puzzler continues to be how the district steelmaking rate can hold near capacity with so little dealer scrap being purchased. The answer apparently is found in the large volume of industrial material flowing back to the mills on an automatic basis.

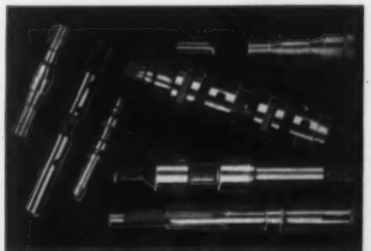
Cleveland—Although scrap prices are unchanged, the market tone is definitely stronger, both on steelmaking and foundry grades. Substantial purchases are reported by foundries in the face of the oncoming vacation season. This is unusual and is believed due to the expectation of active foundry operations over the remainder of the year. Settlement of the Ford and General Motors labor negotiations has served to spark a high degree of optimism for remaining months of the year.

Cincinnati—The local scrap market is extremely quiet. Tonnage is moving on old orders, but there is little in the way of new buying. Dealers report substantial stocks.

Birmingham — Dullness continues in steel scrap, and brokers anticipate further price reductions. The export market is weak. Cast scrap is active, but owing to coming vacations, many foundries are specifying delivery prior to June 15.

Los Angeles—Dealers report little change in business conditions. Activity for the first two weeks in June varied only slightly from that of preceding months, but some dealers foresee a firming up of the cast

(*Please turn to page* 172)



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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

June 15	$35.00
June 8	35.00
May Avg.	34.87
June 1954	27.92
June 1950	39.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting..	34.00-35.00
No. 2 heavy melting..	31.00-32.00
No. 1 bundles	34.00-35.00
No. 2 bundles	26.00-27.00
No. 1 busheling	34.00-35.00
Machine shop turnings	20.50-21.50
Mixed borings, turnings	20.50-21.50
Short shovel turnings..	25.00-26.00
Cast iron borings	25.00-26.00
Cut structurals, 5 ft lengths	*37.00-38.00*
Heavy turnings	*34.00-35.00*
Punchings & plate scrap	38.00-39.00
Electric furnace bundles	38.00-39.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	34.00-35.00
Heavy breakable cast..	34.00-35.00
Unstripped motor blocks	25.00-26.00
No. 1 machinery cast..	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	*38.00-39.00*
Rails, 2 ft and under	*49.00-50.00*
Rails, 18 in. and under	*50.00-51.00*
Rails, random lengths	*45.00-46.00*
Railroad specialties	43.00-44.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-240.00
18-8 turnings	110-115.00
430 bundles & solids	100.00-105.00
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumer's plant)

No. 1 heavy melting..	31.00-32.00
No. 2 heavy melting..	25.00-26.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	31.00-32.00
Machine shop turnings	14.00-15.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Low phos.	33.00-34.00
Cut structural plates 2 ft and under	38.00-39.00
Alloy free, short shovel turnings	26.50-27.50
Electric furnace bundles	31.00-32.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	37.00-38.00
Stove plate	43.00-44.00
Heavy breakable cast..	33.00-34.00
Unstripped motor blocks	25.00-26.00
Brake shoes	30.00-31.00
Clean auto cast	44.00-45.00
Burnt cast	32.00-33.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
R.R. malleable	43.00-44.00
Rails, 2 ft and under..	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, random lengths..	44.00-45.00
Cast steel	39.00-40.00
Railroad specialties	39.00-40.00
Uncut tires	43.00-44.00
Angles, splice bars	45.00-46.00
Rails, rerolling	52.00-53.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	200.00-210.00
18-8 turnings	100.00-110.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer's plant)

No. 1 heavy melting..	34.00-35.00
No. 2 heavy melting..	30.00-31.00
No. 1 bundles	34.00-35.00
No. 2 bundles	24.00-25.00
No. 1 busheling	34.00-35.00
Machine shop turnings	16.00-17.00
Short shovel turnings ..	22.00-24.00
Cast iron borings	23.00-24.00
Low phos.	35.00-36.00
Electric furnace bundles	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CHICAGO

No. 1 heavy melting...	33.00-35.00
No. 2 heavy melting...	28.00-29.00
No. 1 factory bundles..	35.00-36.00
No. 1 dealer bundles...	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-35.00
Machine shop turnings.	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings ..	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals, 3 ft ..	36.00-37.00
Punchings & plate scrap	37.00-38.00
Electric furnace bundles	35.00-36.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Stove plate	*33.00-34.00*
Unstripped motor blocks	29.00-30.00
Clean auto cast	45.00-46.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	45.00-46.00
Rails, 2 ft and under..	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Angles, splice bars	43.00-44.00
Rails, rerolling	51.00-52.00

Stainless Steel Scrap

18-8 bundles & solids	*230.00-235.00*
18-8 turnings	95.00-100.00
430 bundles & solids	*100.00-105.00*
430 turnings	45.00-50.00

Chicago Mercantile Exchange
(Week ended June 15)

No. 1 Heavy Melting	High	Low	Close
Oct.	....	....	36.00*
Jan.	....	....	....

Sales (160-ton units): None.
*Nominal

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	27.50
No. 2 heavy melting...	21.00
No. 1 bundles	27.50
No. 2 bundles	19.00
No. 1 busheling	27.50
Machine shop turnings.	13.00
Mixed borings, turnings	13.00
Short shovel turnings ..	16.50
Punchings & plate scrap	33.00

Cast Iron Grades

Charging box cast	28.00
No. 1 cupola	37.00
Stove plate	32.00
Heavy breakable	28.00
Unstripped motor blocks	20.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting...	32.00-33.00
No. 2 heavy melting...	28.00-29.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-33.00
Cast iron borings	15.00-16.00
Short shovel turnings..	19.00-20.00
Machine shop turnings.	17.00-18.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate ..	36.00-37.00
Structural plate, 2 ft ..	36.00-37.00
Unstripped motor blocks	35.50-36.50

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
Rails, 18 in. and under	45.00-46.00
Rails, rerolling	43.00-44.00
Rails, random lengths..	40.00-41.00
Angles, splice bars	43.00-44.00
Std. steel axles	35.00-36.00

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting...	35.50-37.50
No. 2 heavy melting...	32.50
No. 1 bundles	35.50-37.50
No. 2 bundles	*27.00-28.00*
No. 1 busheling	35.50-37.50
Electric furnace bundles	*38.50*
Machine shop turnings.	21.50
Mixed borings, turnings	21.50
Short shovel turnings ..	24.00-25.00
Structurals & plate ...	39.50-41.00
Heavy turnings	*33.50-34.00*
Couplers, springs, wheels	*40.50*
Rails crops, 2 ft & under	50.00-51.00

Cast Iron Grades

No. 1 cupola	36.00
Malleable	45.00
Heavy breakable cast	*41.00*
Drop broken machinery	*44.00-45.00*

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting...	30.00-31.00
No. 2 heavy melting...	27.00-27.50
No. 1 bundles	30.00-31.00
No. 2 bundles	21.00-22.00
Machine shop turnings.	12.00-13.00
Mixed boringh, short turnings	13.00-14.00
Short shovel turnings ..	15.00-16.00
Low phos. (structural & plate)	33.00-34.00

Cast Iron Grades

No. 1 cupola	31.00-32.00
Unstripped motor blocks	*21.00-22.00*
Heavy breakable	*33.00-34.00*

Stainless Steel

18-8 sheets, clips, solids	235.00-240.00
18-8 borings, turnings	105.00-110.00
430 sheets, clips, solids.	95.00-100.00
410 sheets, clips, solids.	75.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*26.00-27.00*
No. 2 heavy melting	*19.00-20.00*
No. 1 bundles	*26.00-27.00*
No. 2 bundles	*18.00-19.00*
Machine shop turnings	*12.00-12.50*
Mixed borings, turnings	*15.00-15.50*
Short shovel turnings	*16.00-16.50*
No. 1 cast	31.00-32.00
Mixed cupola cast	29.00-30.00
No. 1 machinery cast..	34.00-35.00

BUFFALO

No. 1 heavy melting..	29.00-30.00
No. 2 heavy melting..	25.00-26.00
No. 1 bundles	29.00-30.00
No. 2 bundles	23.00-24.00
No. 1 busheling	29.00-30.00
Mixed borings, turnings	20.50-21.50
Machine shop turnings.	19.00-20.00
Short shovel turnings..	21.50-22.50
Cast iron borings	20.50-21.50
Low phos.	32.00-33.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	37.00-38.00
No. 1 machinery	42.00-43.00

Railroad Scrap

Rails, random lengths..	35.00-36.00
Rails, 3 ft and under..	42.00-43.00
Railroad specialties ...	36.50-37.50

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	31.00-32.00
No. 2 heavy melting..	26.00-27.00
No. 1 bundles	31.00-32.00
No. 2 bundles	21.00-22.00
No. 1 busheling	31.00-32.00
Machine shop turnings.	17.50-18.50
Mixed borings, turnings	17.50-18.50
Short shovel turnings ..	21.00-22.00
Cast iron borings	17.50-18.50
Low phos., 18 in.	37.00-38.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Heavy breakable cast..	35.00
Charging box cast	36.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	*31.50-32.50*
Rails, 18 in. and under	47.00-48.00
Rails, random lengths..	40.00-41.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting...	30.00
No. 2 heavy melting...	28.00
No. 1 bundles	30.00
No. 2 bundles	23.50
Machine shop turnings.	15.00
Short shovel turnings ..	17.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	*35.00*
Heavy breakable cast..	33.00
Unstripped motor blocks	33.00
Brake shoes	32.00
Clean auto cast	43.00
Stove plate	33.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.50
Rails, 18 in. and under	46.00
Rails, random lengths..	40.00
Rails, rerolling	50.00
Angles, splice bars	41.00

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting...	33.00
No. 2 heavy melting...	29.00
No. 1 bundles	25.00
No. 2 bundles	23.00
No. 3 bundles	16.00-17.00
Machine shop turnings.	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings ..	15.00-16.00
Electric furnace, No. 1	39.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	36.00-40.00
Heavy breakable cast..	25.00
Unstripped motor blocks	30.00-32.00
No. 1 wheels	24.00-25.00
Stove plate (f.o.b. plant)	28.00-29.00
Brake shoes	28.00-29.00

Railroad Scrap
(Delivered consumer's plant)

Rails, random lengths..	34.00

LOS ANGELES

No. 1 heavy melting...	28.00
No. 2 heavy melting...	24.00
No. 1 bundles	27.00
No. 2 bundles	22.00
Machine shop turnings.	8.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting...	30.00
No. 2 heavy melting...	28.00
No. 1 bundles	29.00
No. 2 bundles	25.00
No. 1 busheling	30.00
Machine shop turnings.	10.00-11.00
Mixed borings, turnings	10.00-11.00
Short shovel turnings ..	12.00
Cast iron borings	12.00
Cut structurals	30.00
Heavy turnings	11.00
Punchings & plate scrap	30.00

Cast Iron Grades

No. 1 cupola	40.00-43.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast..	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

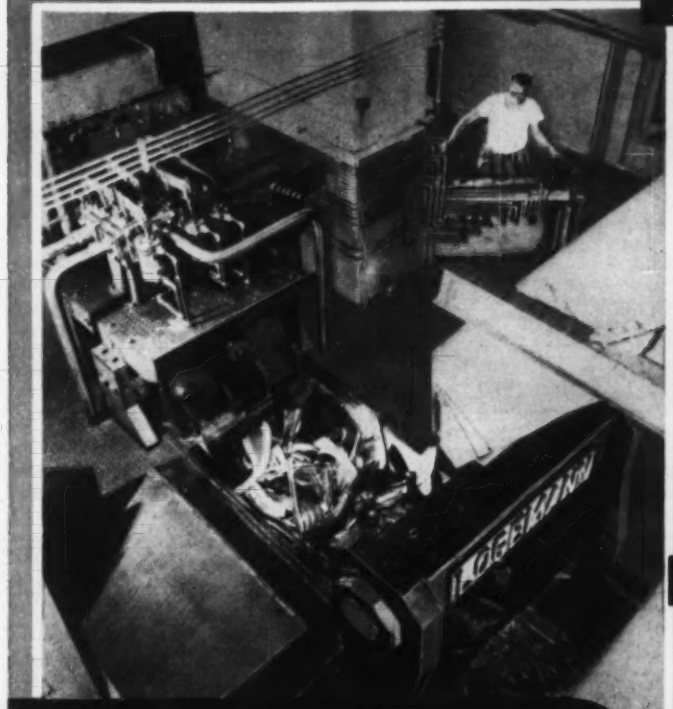
(Delivered prices)

No. 1 heavy melting...	34.00
No. 2 heavy melting...	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Mixed borings, turnings	16.00
Rails, remelting	43.00
Busheling, new factory: Prepared	32.00
Unprepared	28.00
Short steel turnings	16.00

Cast Iron Grades†

No. 1 machinery cast..	42.00-45.00

†F.o.b., shipping point.



LOGEMANN Metal Balers

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In the large stamping plants and rolling mills where it is critically important that trim and stamping skeletons are quickly disposed of to avoid interference with production, LOGEMANN metal balers are relied on to keep ahead of production and pack such scrap into high density, self-cohering bricks for re-melting.

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LOGEMANN models are not confined to the large sizes. Many small plants have found it profitable to use smaller sizes embodying the same features of reliability, at minimum operating cost. Interested parties are invited to write for details. Information as to the character of the scrap, tonnage to be handled in a given period of hours, and range of gauges is helpful in determining the proper model.

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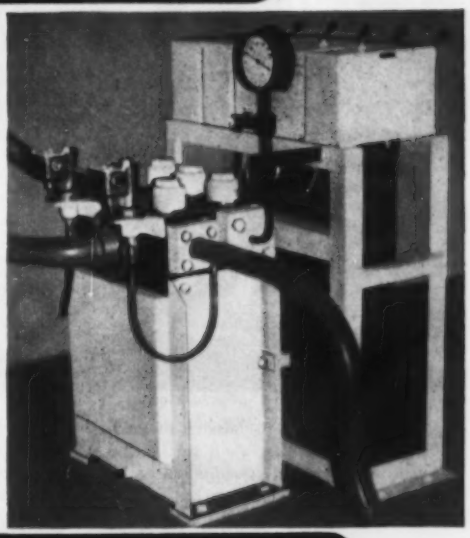
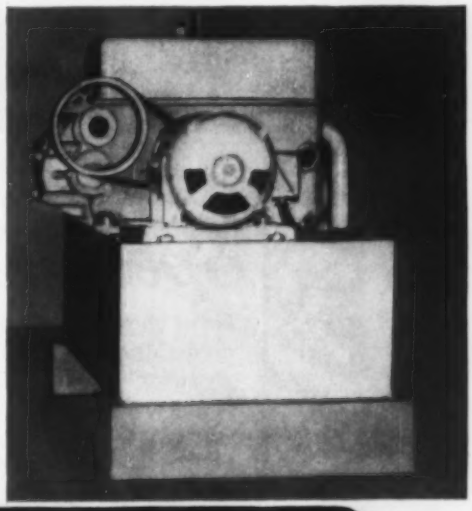


HYDRAULIC VALVES

The illustration shows a close-coupled hydraulic valve, operated by compressed-air cylinders for high-speed distribution of large gallonage of fluid at high pressure. LOGEMANN engineers have designed and built valves for many unusual as well as standard applications, and will welcome inquiries, with an outline of the conditions and requirements.



HYDRAULIC PUMPS

The opposed-cylinder close-coupled double pressure pump shown in the illustration is mounted on an individual tank to conserve floor space under present crowded plant and operating conditions. When requesting details, please indicate the nature of the service, pressure and gallonage requirements, and the fluid to be handled.

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(*Concluded from page* 169)

scrap market that should bring a price increase within two weeks.

San Francisco—June probably will go down as the biggest month since before World War II in exports of steel scrap.

Seattle—While No. 1 and No. 2 heavy melting steel grades are still quoted at $33 and $29, respectively, some dealers sense a weaker market tone which may result in downward adjustments by July 1. Present high levels have stimulated collections, and receipts at tidewater have resulted in a sizable surplus.

Full cargo chartering from North Pacific ports has been active recently. Six foreign vessels have been chartered to haul scrap to Japan at rates ranging from $140,000 to $150,000 per ship per voyage, cargoes averaging 8500 to 9000 tons.

Pig Iron . . .

Pig Iron Prices, Page 157

Foundry operations are spotty, but are holding up better than expected. Gray iron and malleable shops serving the automotive industry are setting the pace and are looking for an active third quarter.

Over-all, there is less demand for pig iron than a month ago. The lag in buying likely will become more pronounced as the vacation season approaches. Iron shipments already are reflecting this. Furthermore, there is less protective covering against a probable price increase early in the third quarter.

In the Los Angeles district, melters are operating at over 100 per cent of capacity, with inquiries increasing over a wide range of products.

Producers continue to increase their operations. U. S. Steel Corp. has blown in its No. 6 blast furnace at Gary, Ind., making 42 of 43 stacks in the Chicago district active. March and April, 1953, are the only two previous months in which this district has had this many furnaces operating.

Colorado Fuel & Iron Corp. relighted the blast furnace at its E. & G. Brooke plant, Bridsboro, Pa., on June 9 after extensive reconditioning. It had been idle since May 20, 1954.

Chester Blast Furnace Inc., Chester, Pa., will resume operations July 1 at its furnace which has been banked for several weeks. Chester will devote production chiefly to No. 2 foundry and malleable iron. It has advanced prices on new orders for these grades $5 a ton to $53.50 for No. 2 foundry and $54 for malleable, f.o.b. furnace. The new prices

are $5 a ton under those quoted by other domestic competitors, the Chester prices previously having been $10 a ton under.

Hanna Furnace Corp., a subsidiary of National Steel Corp., has boosted operations at Susquehanna Furnaces, Buffalo, to 100 per cent of capacity for the first time since last fall.

Structural Shapes . . .

Structural Shape Prices, Page 152

Another bulge in structural steel demand looms in New England. Connecticut bridges included in the state's highway program will require an estimated 175,000 tons of steel.

An outstanding development in the district market is the wide distribution of fabricating contracts, notably with shops normally doing a minimum of bridge work. Buffalo, Elizabeth, N. J., and Scranton, Pa., fabricators have shared heavily in the work.

Demand for steel piling is heavy in the area, and while a leading Pittsburgh producer is equalizing freight on sheet piling, it is not following that policy on structural piling.

Public construction projects are prominent in market activity at all points. In New York a program of new school work, involving 24 projects, including both new units and additions, will come out shortly for figures.

Over 13,000 tons of highway work in the Philadelphia area were scheduled for closing before the end of last week. The largest single project called for 7500 tons of approach work for the Gloucester-Philadelphia bridge.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4100 tons, bridge, turnpike sec. 36-EF, Carbon county, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

285 tons, state bridge, contract IR-66021, York, Pa., through Jack & Jim Maser, Brownstown, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

260 tons, addition to Schuylkill station, Philadelphia Electric Co., Philadelphia, to Ingalls Iron Works, Verona, Pa.

250 tons, monastery retreat house, West Springfield, Mass., to Haarmann Steel Co., Holyoke, Mass.; J. G. Ray & Sons Inc., Springfield, Mass., general contractor; reinforcing to Truscon Steel Division, Republic Steel Corp., Boston.

180 tons, state highway bridges, Derby-Ansonia, Conn., to Bethlehem Steel Co., Bethlehem, Pa., through Jarvis Construction Co., Manchester, Conn., general contractor.

175 tons, approaches to Ross Island bridge, Oregon state highway project, to Poole, McGonigle & Dick, Portland, Oreg.; Manson Construction & Engineering Co., Seattle, general contractor.

160 tons, classroom building, University of Massachusetts, Amherst, Mass., to Haarmann Steel Co., Holyoke, Mass.; M. J. Walsh & Sons Inc., Holyoke, general contractor.

135 tons, office building, Camden, N. J., to General Iron Works Inc., that city, through Mahoney-Trost Construction Co., Philadelphia.

105 tons, building, Missionary Sisters, Reading, Pa., through L. H. Focht & Son Inc.,

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ONE ELECTRIC ARC STEEL MAKING FURNACE
1-2 tons nominal capacity with or without transformer and auxiliary equipment.
Also STEEL MAKING INDUCTION FURNACE with nominal capacity of 100-300 lbs.
Specify condition, age, and price.
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Help Wanted

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TOP FLIGHT EXECUTIVE VICE PRESIDENT willing to make a substantial investment in an old established very profitable steel plate fabricating plant. Must be well qualified in all phases of the business. Good qualifications will put you in line for President within two years or sooner. Reply Box 250, STEEL, Penton Building, Cleveland 13, Ohio.

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Positions Wanted

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College man—41—Thoroughly experienced in all phases of Steel Fabrication desires similar position. Will relocate. Reply Box 267, STEEL, Penton Building, Cleveland 13, Ohio.

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¶ What's the best way to strip large areas of structural metal where a steam supply is available? *See page 5.* Where steam is not available? *See page 7.*

¶ What are the best ways to prepare stripped metal for repainting? *See page 11.*

¶ What strippers are best for removing oil-base paints? . . . Synthetic enamels, alkali-resistant plastics or resin-based paints? . . . Japans, wrinkle finishes, nitrocellulose lacquers, alkyds, phenolics and ureas? *See page 12.*

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general contractor, to Modern Iron Works, that city.

STRUCTURAL STEEL PENDING

7000 tons, section of approach work, Gloucester-Philadelphia bridge, contract G-4, for the Delaware River Port Authority; New York Shipbuilding Corp., Camden, N. J., low with bid of $3,758,514, compared with $4,266,974 for Bethlehem Steel Co., Bethlehem, Pa.; and $4,351,484 for American Bridge Division, U. S. Steel Corp., Pittsburgh.

5120 tons, 13 bridges and 5 concrete box culverts, Massachusetts turnpike, Millbury-Auburn, Mass.; bids June 21, Boston; also 2685 tons of reinforcing steel and 16,100 linear ft of steel piling.

2844 tons, New York state bridge work, bids June 23; tonnage comprises 134 tons in Montgomery county; 88 tons in Hopkins; 578 tons, including 293 of high strength, low alloy steel, in St. Lawrence county; 624 in Broome; and 1420 tons for three jobs in Queens in connection with the Horace Harding expressway.

2280 tons, state turnpike bridge work, section 37-AB, Carbon county, and section 37-DE, Luzerne county, Pa.; bids June 29.

890 tons, state turnpike bridge, section 36-G, Carbon county, Pa., Central Pennsylvania Quarry & Stripping Co., Hazelton, Pa., awarded general contract.

700 tons, New York University residence building, Bellevue Hospital, New York; Cauldwell-Wingate, low on general contract.

650 tons, field house, Haverford College, Haverford, Pa.; bids closed June 14.

500 tons, Board of Transportation contract 119-G, Liberty Ave. and Rockaway Branch, Queens, New York; bids closed June 17.

130 tons, including reinforcing, Salmon river bridge, Boise National Forest, bids to forest supervisor, Boise, Ida., June 21.

REINFORCING BARS . . .

REINFORCING BARS PLACED

370 tons, military projects, Ladd and Elmendorf Air Bases, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Island Construction Co., Anderson, Montain, Benson, Seattle, joint general contractors.

300 tons, classroom building, University of Massachusetts, Amherst, Mass., to U. S. Steel Supply Division, U. S. Steel Corp., Cambridge, Mass.; M. J. Walsh & Sons Inc., Holyoke, Mass., general contractor.

250 tons, junior-senior high school, North Reading, Mass., to Joseph T. Ryerson & Son Inc., Boston; L. & R. Construction Co., Medford, Mass., general contractor.

135 tons, airmen's dormitory, Great Falls, Mont., to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, including parochial school and other projects, to Northwest Steel Rolling Mills Inc., Seattle.

REINFORCING BARS PENDING

104 tons, Washington state, two bridges, King county; A. J. Cheff Construction Co., Seattle, low at $75,166.

PIPE . . .

CAST IRON PIPE PLACED

350 tons, various sizes for Prosser, Wash., and Hutchinson Irrigation District, Spokane, Wash., to U. S. Pipe & Foundry Co., Seattle.

STEEL PIPE PLACED

134 tons, 28-in. steel pipe, Army Engineers, Philadelphia, to Posey Iron Works, Lancaster, Pa.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Norfolk & Portsmouth Belt Line, five 1200-hp road switching diesel units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

RAILROAD CARS PLACED

Chesapeake & Ohio, 500 fifty-ton box cars to ACF Industries, New York.

Denver & Rio Grande Western, 100 double deck stock cars, to own shops.

Missouri-Kansas-Texas, 25 fifty-ton flat cars to its own shops, Denison, Tex.; purchase of 600 miscellaneous box cars and 75 seventy-ton covered hopper cars also authorized.

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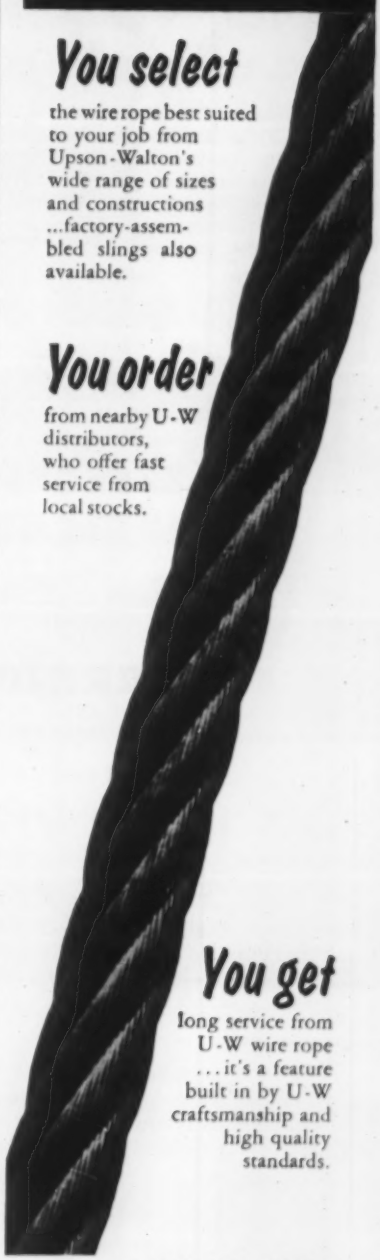
UPSON-WALTON
wire rope

You select
the wire rope best suited to your job from Upson-Walton's wide range of sizes and constructions ...factory-assembled slings also available.

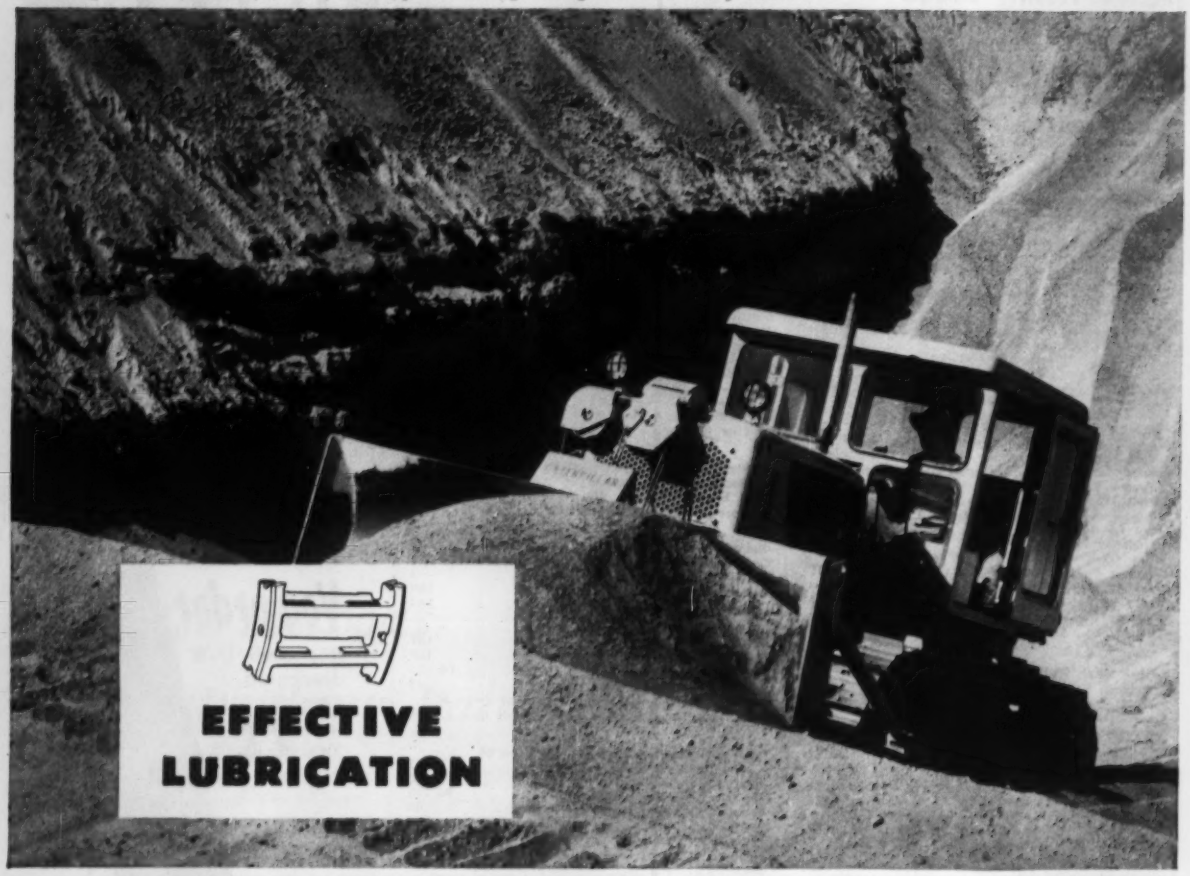
You order
from nearby U-W distributors, who offer fast service from local stocks.

You get
long service from U-W wire rope ...it's a feature built in by U-W craftsmanship and high quality standards.



THE UPSON-WALTON COMPANY
12500 ELMWOOD AVE. • CLEVELAND 11, OHIO
New York • Chicago • Pittsburgh
MANUFACTURERS OF
WIRE ROPE, ROPE FITTINGS, TACKLE BLOCKS
ESTABLISHED 1871

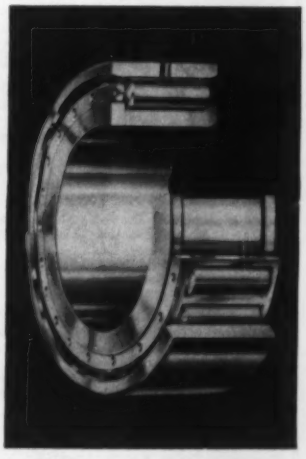
IN THE CRUSHED STONE INDUSTRY, TORRINGTON *Bearings are used in many applications including crushers, screens, shovels, cranes, pulverizers, grinding mills and rotary kilns.*



Photograph courtesy of Caterpillar Tractor Co.

TORRINGTON Radial Roller Bearings

are designed with one-piece bronze retainer that keeps rollers correctly aligned and effectively lubricated



Here are other reasons why TORRINGTON RADIAL ROLLER BEARINGS can meet your load and speed requirements. Only the finest quality steels, heat treated according to the most modern methods, are used in manufacture.

Precision tolerances and finishes on both rollers and races guarantee low eccentricity and uniform load distribution.

One-piece, cast-bronze cages help minimize wear, facilitate lubrication, and lengthen bearing life.

Machined pads in each cage-pocket guide the rollers accurately at the pitchline.

Specify TORRINGTON RADIAL ROLLER BEARINGS for your equipment. They are interchangeable in all types and sizes and custom engineered to meet the toughest, heavy duty assignments.

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.

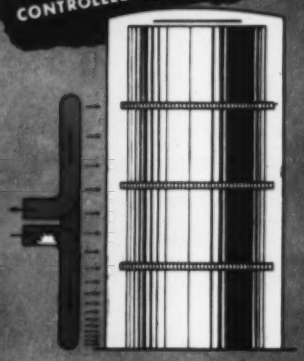
District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON RADIAL ROLLER **BEARINGS**

Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

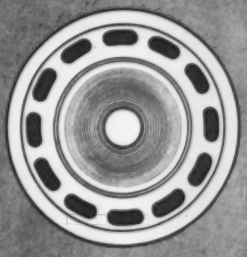
Here's why you can't beat Lee Wilson RADIANT "O" TUBE Annealing Furnaces

CONTROLLED VERTICAL HEAT



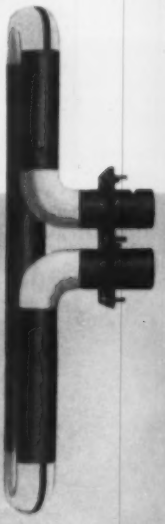
Only the Lee Wilson "O" Tube is able to carry a 500,000 BTU per hour input and disperse it where it can be of most use with major release at the bottom of the tube. An exclusive dual pressure burner permits flame length to be set where required for all ranges of turndown. Thus, the "O" Tube puts the heat where it's needed and gives the operator full control over its vertical release.

UNIFORM HORIZONTAL HEAT



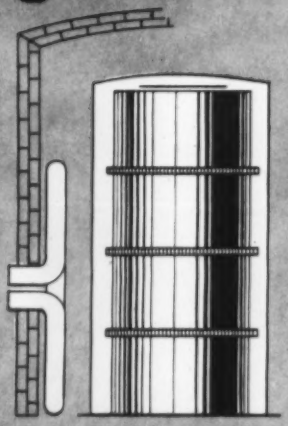
The design of the "O" Tube permits it to be installed in the furnace in a most efficient manner. The tubes completely circle the charge at uniform spacing enabling exacting control of the heat horizontally.

LOW TUBE COST PER TON



"O" Tubes are fabricated of a special heat resisting alloy. Their design gives them a much greater dispersion area which means the rate of heat transfer per square inch is lower than other radiant tubes. The result: tubes last longer — average cost per tube per ton annealed is less than three cents.

LOW MAINTENANCE



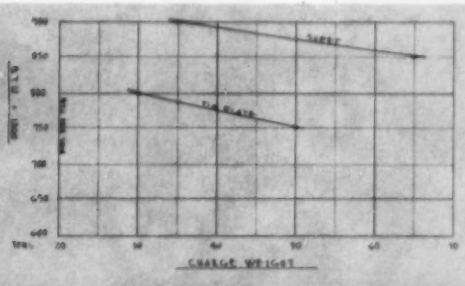
The use of "O" Tubes greatly reduces the cost of furnace maintenance. There's absolutely no chance of a destructive flame burning either the inner cover or the brick work. The uniform heat application around the inner cover prevents inner cover buckling. No holes in furnace arch to give "fallen arches" to the maintenance crew.

After extensive on-the-job testing and cost comparison, we are satisfied the Lee Wilson "O" Tube has no equal as a medium for producing and transferring uniform, high heats for metals annealing. Through the "O" Tube, you are assured of exacting heat control in all parts of the furnace; an efficiency far in excess of that in other types of tubes, and the lowest possible furnace maintenance.

In brief form here we have pointed some of the reasons why the "O" Tube is preferred wherever a thorough comparison is made. Why not ask a Lee Wilson engineer to give you the entire story?

REAL FUEL ECONOMY

The "O" Tube puts every unit of heat to work. There's no waste. The charge is brought to heat fast — held at heat, economically. On-the-job tests prove the average fuel economy to be 850,000 BTU/ton for sheet coils and 750,000 BTU/ton for tinplate coils.



Recent installation of Lee Wilson furnaces in one of America's leading steel firms. These furnaces are equipped with ten 6-inch "O" Tubes each, with a total input of 5,000,000 BTU per hour.

Lee Wilson ENGINEERING COMPANY, INC.

20005 WEST LAKE ROAD • CLEVELAND 16, OHIO

New mill on TIMKEN® bearings tapers 10′ x 33′ aluminum sheets for aircraft wings

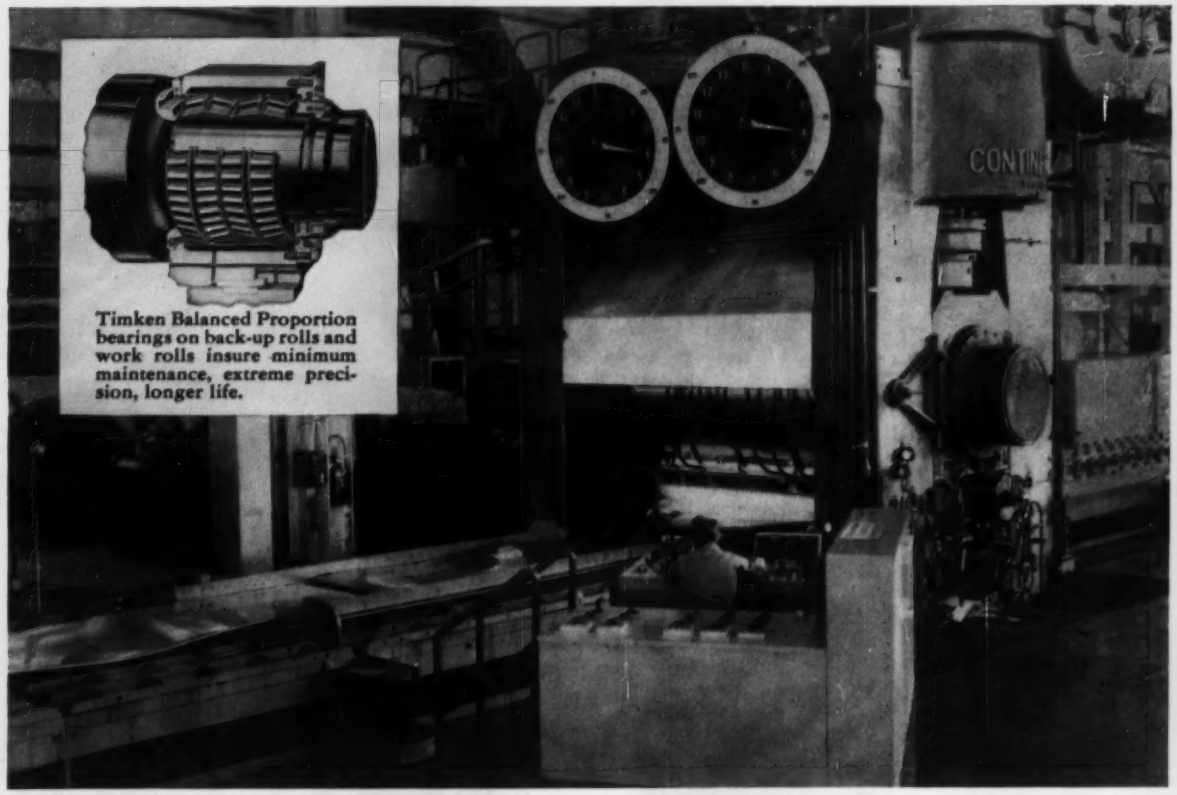
A 4-HIGH reversing mill, 23″ x 60″ x 144″, which tapers aluminum sheet and plate up to 10′ wide and 33′ long, is now in operation. This mill is used for the fabrication of tapered sheet and plate. Tapered sheet and plate products permit the fabrication of modern aircraft of increased speed and increased carrying capacity at no sacrifice in strength. Built by the Continental Foundry & Machine Company, this huge new rolling mill uses Timken® tapered roller bearings on back-up rolls, work rolls, screw-downs and breaker blocks.

Timken balanced proportion bearings give this mill the extreme precision required in such rolling operations. Timken balanced proportion bearings have load ratings up to 40% higher than the same-size bearings in older designs. In some mills, they increase bearing life expectancy almost three times. And the mill can be stopped and restarted without altering or relieving screwdown pressures.

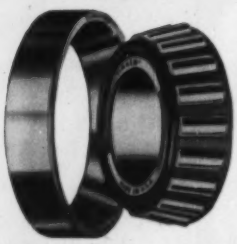
Timken bearings, because they're tapered, take both radial and thrust loads in any combination. They practically eliminate friction because they're designed by geometrical law to have true rolling motion. And made with extreme accuracy to conform to their design.

Always specify Timken bearings in the equipment you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



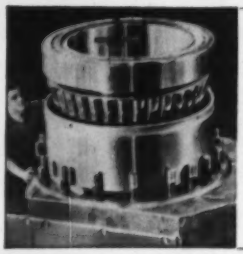
Timken Balanced Proportion bearings on back-up rolls and work rolls insure minimum maintenance, extreme precision, longer life.



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



ROLL NECK BEARING ENGINEERING SERVICE

Our field and service engineers have had years of experience with problems of roll neck bearing design and operation. They'll help you select bearings and design mountings.

Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. nickel-rich Timken alloy steels.

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL AND THRUST → ← LOADS OR ANY COMBINATION